

Final Report

(2017)

For the attention of:

Community Sports & Activity,

London Borough of Barking and Dagenham Team

& Sport England

*An evaluation of the efficacy of physical activity interventions
in an east London and an Essex borough: Active Sport for Life, exercise & gym-swim.*

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Executive Summary

What did we do?

In total, 289 people were co-opted as respondents in the evaluation component of this Sport England funded project, 212 (72%) women and 77 (25%) men. These respondents had engaged in at least the first session at the beginning of their respective activity programme. They were distributed across four intervention groups: 71 people from Thurrock who participated in the Active Sport for Life (ASfL) programme, (20 men & 51 women); 120 from Barking & Dagenham who also participated in the ASfL programme, (26 men & 94 women); 56 from Barking & Dagenham participating in the exercise on-referral programme (14 men & 42 women) ; and, 42 people from Thurrock who participated in the Gym&Swim intervention, i.e. exercise & sport (14 men & 28 women).

Self-report questionnaires measuring physical activity and mental and physical health were administered at six time points to all participants during a twelve month follow-up period. Data from these questionnaires were entered into the Statistical Package for the Social Sciences (SPSS) and examined using inferential statistical techniques.

What did we find?

All three programmes, EoR, ASfL and Swim&Gym, produced beneficial effects for participants over time for all activity measures (for vigorous & moderate exercise, walking, sport, all activity, and all exercise), for physical health, and for three psychological variables, namely wellbeing, loneliness and motivation. Notably, the gym-swim programme (which combines sport and exercise) produced the biggest positive change in well-being.

Overall, we did not find compelling evidence to support the idea that sport based programmes would provide better outcomes than exercise based ones, though there is limited evidence to suggest that a programme combining the two approaches (i.e. gym-swim) may produce better psychological outcomes.

Participants in the EoR group spent significantly more time engaged in walking and 'all exercise' than did those in the ASfL group. As to be expected however, participants in the ASfL group spent significantly more time engaged in sports activity than did those in the EoR group.

Notably, for three health check measures, diastolic blood pressure, number of units of alcohol and number of cigarettes smoked in the preceding week, statistically significant differences across the three time points were found. Both groups showed improvement in diastolic blood pressure, reduced units of alcohol consumption and reduced numbers of cigarettes smoked over the course of the programmes. However, participants in the EoR group reduced their smoking significantly more than did those in the ASfL group across three time points (from baseline to six weeks and three months).

What did we conclude?

No one form of activity appears to be consistently better than the other. In this ASfL evaluation we did not find compelling evidence to conclude that sports activities may have superior outcomes associated with them than exercise-based ones. Indeed, it was apparent that both forms of activity confer benefits over time upon participants. We note though that a combination of sport and exercise in the form of the gym-swim programme may produce both good physical health outcomes and somewhat better psychological ones than single-mode programmes.

What do we recommend?

Boroughs and councils should provide people who have activity referral needs with a choice of either exercise, sport or sport & exercise programmes to maximise opportunities for engagement since each of these forms of activity provide physical and mental health benefits. Additional efforts are needed to engage GPs to refer to the Active Sport for Life Programme, and to encourage them to refer participants with a BMI of 28+ where they judge it to be clinically safe to do so. Given the significantly greater uptake of provision by women, particularly of ASfL, it is recommended that additional efforts are made to recruit men onto physical activity programmes. Further, it is recommended that ongoing provision of physical activities in the boroughs takes account of the fact that swimming is the most popular activity and the one that is reported as most enjoyed. Lastly, it is recommended that irrespective of physical activity type (whether EoR or ASfL or the combined 'gym-swim' programme) that on entry all participants should be offered free, ongoing twelve month membership, subject to attendance continuing at a minimum of two sessions per week (120 minutes of activity).

Background

In January of 2013 Professor McDermott met with Emma Gillan & Gemma Jay and thereafter UEL lent its support to the Sport for England bid which was successful. Following this, activity from April 2013 through to October 2013 led to the establishment of a Service Level Agreement (SLA) between LBBD and UEL re the provision of expertise to oversee preparation and analysis of data from the Active Sport for Life programme.



Barking and Dagenham town hall

I: Introduction & review of academic literature relevant to the project

From the outset it is important to specify the meaning and frame of reference of the three key concepts that form the focus of this work, specifically: physical activity, sport, and exercise. So, definitions of these three key concepts are considered first in this introduction to the report. Thereafter, considered here are the physical and mental health benefits of activity. After this are reviewed factors that influence the success of interventions which have sought to increase activity levels, leading thereafter to a concise summary of the purpose and remit of the intervention study reported and evaluated here.

I.I Defining 'physical activity', 'sport' and 'exercise'

Physical activity. The World Health Organisation (WHO) define physical activity as any bodily movement produced by skeletal muscles that requires energy expenditure. Likewise, NHS health Scotland define physical activity as a general term which relates to any movement of the body that uses energy. This deliberately broad definition means that virtually all types of activity can be beneficial including: exercise, sport, play, dance and 'active living' such as walking, cycling for transport, housework, gardening and work. Thus, sport and exercise are forms of physical activity.

Sport. The UK sports councils do not define what is and what is not a sport. There are many different opinions as to what constitutes a sporting activity and the sports councils do not have a single definition of sport. However, they operate a recognition process to establish with which sports they may consider working. When deciding whether to recognise a sport, the sports councils look to see if it meets the Council of Europe's European Sports Charter's 1993 (ESC) definition of sport and if the sport is well established and organised within our jurisdiction. The ESC define sport as *'all forms of physical activity which, through casual or organised participation, aim at expressing or improving physical fitness and mental well-being, forming social relationships or obtaining results in competition at all levels'*.

Exercise. The WHO state that: *'Exercise, is a subcategory of physical activity that is planned, structured, repetitive, and purposeful in the sense that the improvement or maintenance of one or more components of physical fitness is the objective'*. Physical activity includes exercise as well as other activities which involve bodily movement and can be done as part of playing, working, active transportation, house chores and recreational activities.

I.II The effects of activity on physical health

Physical inactivity (lack of physical activity) has been identified as the fourth leading risk factor for global mortality, 6% of deaths globally (WHO, 2009). Moreover, physical inactivity is estimated to be the main cause for approximately 21–25% of breast and colon cancers, 27% of diabetes cases and approximately 30% of ischaemic heart disease burden. Regular physical activity in adults has been found to reduce the risk of hypertension, coronary heart disease, stroke, diabetes, breast and colon cancer, and the risk of falls in the elderly (WHO, 2009). It also is associated with improvements in bone and functional health (mobility), and, given it is a key determinant of energy expenditure, it is fundamental to weight control (WHO, 2009).

To illustrate these benefits of activity of physical health, a key review and associated studies will be briefly considered here. A systematic review of longitudinal studies examining the long-term health benefits of physical activity on the development of non-communicable diseases (NCD) has been conducted by Reiner, Niermann, Jekauc & Woll (2013). NCDs include weight gain, obesity, coronary heart disease and type 2 diabetes mellitus. Specifically, Reiner et al (2013) looked at fifteen longitudinal studies with at least a five-year follow up and thereby at a total of 288,724 respondents aged between 18 and 85 years. The results of this analysis showed that physical activity appears to have a positive long-term influence on all selected diseases and to be a relevant factor for preventing age-related diseases.

One of the studies included in the systematic review, for example, by Hu, Sigal, Rich-Edwards, Colditz, Solomon, Willett, Speizer and Manson (1999), examined the relationship between total physical activity and the incidence specifically of type 2 diabetes in women. This study compared the benefits of walking versus vigorous activity as predictors of subsequent risk. The study incorporated 70,102 female nurses aged 40 to 65 years who did not have diabetes, cardiovascular disease, or cancer at the beginning of the research in 1986. Participants were followed up in 1988 and 1992. During the eight years of the follow-up 1419 cases of type 2 diabetes were recorded. It was found that a greater physical activity level was associated with a substantial reduction in risk of type 2 diabetes, even if that activity was of only moderate intensity and duration. Another study (Demakakos, Hamer, Stamatakis, Steptoe, 2010) included in the systematic review examined whether small amounts of low-intensity physical activity were associated with reduced risk of developing type 2 diabetes in a sample of people aged 50 years and over. The results showed that vigorous to moderate-intensity physical activity at least once a week was associated with reduced risk of type 2 diabetes but low-intensity physical activity at least once a week was not after adjustment for other factors. However, when the analysis took age of participants into consideration, it was found that low-intensity physical activity at least once a week was associated with reduced risk of type 2 diabetes for those aged 70 years and over but not for those aged 50 to 59 years or those aged 60 to 69 years. Compared with physical inactivity, any type of physical activity was found to reduce the risk of type 2 diabetes in adults aged 70 years and over, while in adults aged 50 to 69 years, physical activity needed to be vigorous or moderate in intensity to be associated with reduced risk. These studies illustrate the point that the benefits of activity for physical health are determined by a combination of different level of activity intensity and participant age. Importantly, it can be noted that even low intensity activity is beneficial for the most elderly participants.

I.III The effects of activity on mental health

As for physical health, the beneficial effects of activity on various mental health outcomes have been well documented by research. Some of these studies will be considered here to illustrate the nature of this relationship. Bherer, Erickson & Liu-Ambrose (2013) conducted a review of cross-sectional, longitudinal, and intervention studies that have attempted to assess to what extent physical activity and exercise can impact the cognitive functioning of older adults, who have various ongoing physical and psychological conditions. They reviewed studies conducted with healthy older adults, frail patients, and persons suffering from mild cognitive impairment and dementia. From their review they conclude that physical exercise is a promising non-pharmaceutical intervention to prevent age related cognitive decline and neurodegenerative diseases. Also, Anderson & Shivakumar (2013) highlight the anxiolytic effects of exercise,

impacting as it does a number of biological, as well as psychological, systems. Similarly, Craft & Perna (2004) in their review discuss the relationship between exercise and depression, given the former's great promise as a behavioural intervention for alleviating symptoms of low mood. The efficacy of such interventions suggests that their focus should be on the frequency of exercise rather than duration or intensity until the behaviour has been well established. Encouraging participants to monitor their mood and activity increases awareness of the benefits of exercise involvement, which in itself then becomes reinforcing. In their review, Craft & Perna (2004) also note that cost effective brief telephone contact, even if automated, increases adherence to exercise programs. Thus, activity can be seen to be of benefit to various psychological components of mental health.

Some research has sought to compare the effects of activity on mental health relative to other kinds of intervention, whilst other work has examined whether activity is more effective when experienced with others versus alone. For example, Strid, Andersson, Forsell, Ojehagen & Lundh (2016) conducted a study in which they compared the effects of internet-based Cognitive Behavioural Therapy (CBT) with a physical exercise intervention and a treatment as usual condition. Over 278 participants in each condition through to twelve month follow-up took part in this study. They found that both of the interventions produced improvements in psychological functioning and sleep disturbance, with greater effects notable among women than men. Further, Karbandi, Gorji, Mazloum, Norian & Aghei (2015) examined the effectiveness of group versus individual yoga sessions on fatigue in 89 people with multiple sclerosis (MS). The fatigue level of patients was evaluated in both groups at three time points: before, three and six weeks after the intervention. Improvements in fatigue were noted in those allocated to the individual sessions, contrary to other studies that have shown a more significant effect of activity when undertaken in groups (Burke, Carron, Eys, Ntoumanis & Estabrooks, 2006). Thus, it can be seen that various forms of activity have tangible effects on aspects of mental health and well-being and further that different kinds of activity have differential effects.

Finally, in this section it should be noted that as well as activity affecting mental health, the reverse is also the case, that mental health affects engagement in physical activity: in a review of the literature by Mathew, Kolehmainen & Sinha (2014) which examined the effects of stress on physical activity and exercise in 168 studies, it was concluded that the experience of stress impairs efforts to be physically active. This reminds us that the provision of activity programmes may well be enhanced if accompanied by other kinds of mental health interventions.

I.IV Previous interventions for increasing activity

The World Health Organisation recognises that increasing physical activity is not just the responsibility of individuals but also is that of society, with population-level, multidisciplinary, cross-sector and culturally atuned approaches being needed (WHO, 2009). Past research has sought to identify the characteristics of targeted activity interventions to find out what works best with whom and why. With this in mind, Burke, Carron, Eys, Ntoumanis & Estabrooks (2006) have conducted a meta-analysis which compared the relative merits of different contexts in which physical activity interventions can occur. Specifically, they looked at four contexts: home-based programs not involving contact from researchers or healthcare professionals; home-based programs that involved some contact; standard exercise classes; and exercise classes where group-dynamic principles were used to increase

cohesiveness ('true groups'). They considered five categories of outcomes: adherence, social interaction, quality of life, physiological effectiveness, and functional effectiveness. In all for their review they identified 44 relevant studies. Results revealed a common trend across these studies: exercising in a 'true group' was superior to exercising in a standard exercise class, which in turn however, did not differ from exercising at home with contact. Nevertheless, exercising at home with contact was found to be was better than exercising at home without contact. These results imply that activity groups, such as a sports team, that are not artificially contrived but have their own naturally occurring internal group dynamic and identity, may have better effects than those that are more artificially constructed, such as a standard exercise class. The results of this review study thereby has clear implications for the nature of activity referral programmes.

The superior effects of 'true groups' such as sports teams noted by Burke et al (2006) may be explained in part by the different kinds of motivation underpinning involvement in each. Frederick & Ryan (1993) examined the motivational factors that influence adult engagement in physical activity, looking at two general classes of activities: those characterized as sport and those representing fitness and/or exercise. They found that people who take part in sport are more motivated by interest, enjoyment and a desire to be competent in what they are doing than those taking part in fitness and exercise activity who are more concerned about body related and appearance considerations. They also found that such motivations are influenced too by whether the participant is male or female. The findings from this often cited study underscore the importance of considering both type of physical activity and the motives that energize participation.

I.V The current project

Given the beneficial effects of physical activity on physical and mental health, and given the findings from previous studies that highlight the different motives and possibly superior effects of sports activity over exercise, gym-based activity programmes, we sought here to evaluate the likely differential effects of a community sports referral programme as compared those derived from a standard community exercise referral programme, this study being based in two east London boroughs. The primary hypothesis of the study was that the community based sports referral programme would lead to better mental and physical health outcomes over the course of its delivery and thereafter at follow-up as compared with those outcomes accruing from the standard community exercise referral programme. The design, method, and results of this evaluation hereafter are reported, with discussion of what was found and associated recommendations following at the end of the report.

II: The research project – methods and design

II.I: Design

The design of the project is represented in Figure 1. Essentially the project employs two main conditions-as-intervention, Sport versus Exercise, and follows up participants in each of these over five time points, with the same outcome measures being taken at each time point. Thereby in formal terms a repeated measures longitudinal design was employed.



Football in Thurrock

Get Healthy, Get into Sport – Barking and Dagenham and Thurrock Joint Bid

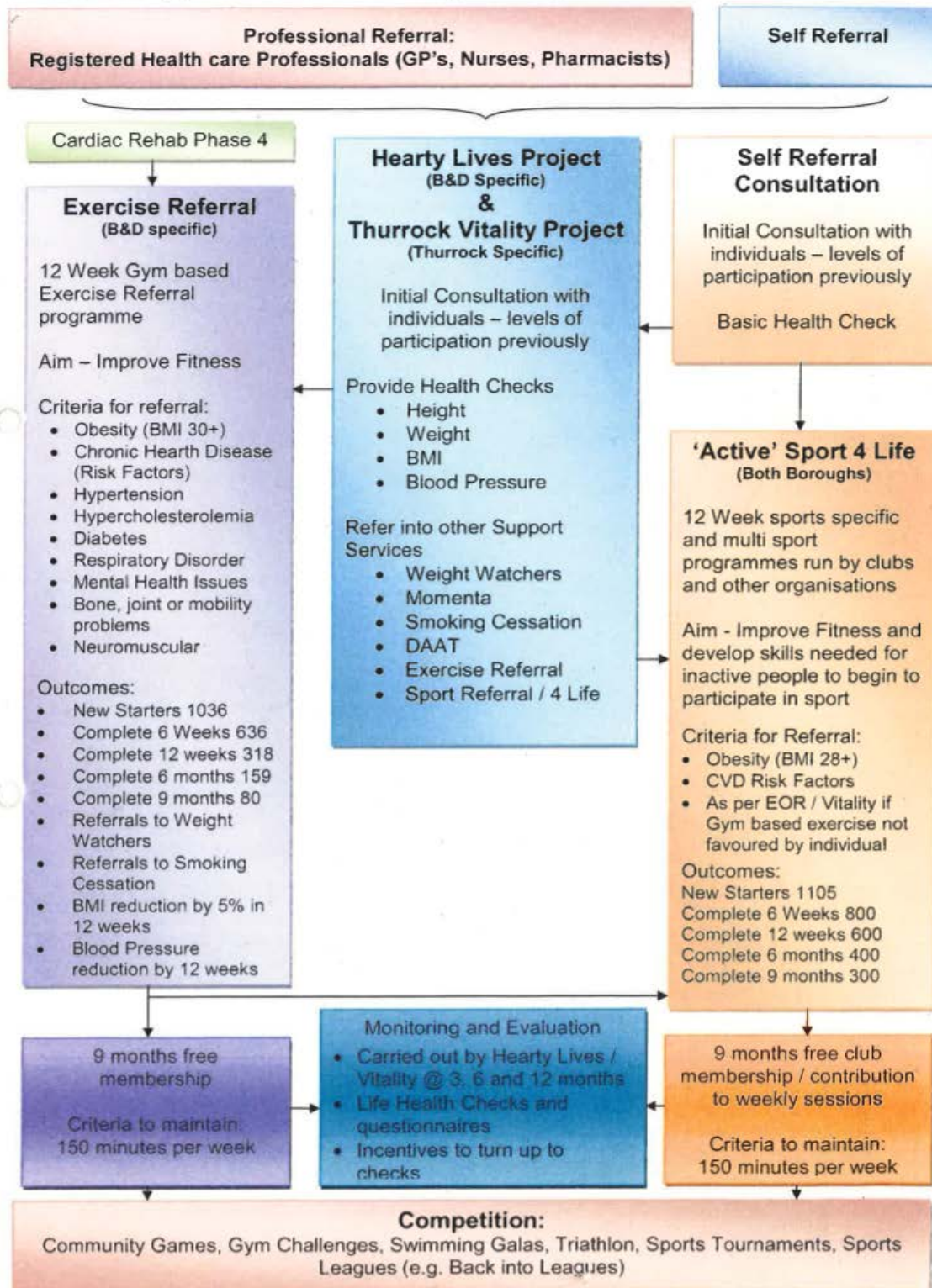


Figure 1: a visual representation of the study design

II.II Participants

Total Study Sample

In total, 289 people were co-opted as respondents in the evaluation component of the Sport England funded project, 212 (72%) women and 77 (25%) men. These respondents had engaged in at least the first session at the beginning of their respective activity programme. They were distributed across four intervention groups: 71 people from Thurrock who participated in the Active Sport for Life programme, (20 men & 51 women); 120 from Barking & Dagenham who also participated in the Active Sport for Life programme, (26 men & 94 women); 56 from Barking & Dagenham participating in the exercise on-referral programme (14 men & 42 women) ; and, 42 people from Thurrock who participated in the Gym&Swim intervention, i.e. exercise & sport (14 men & 28 women).

The average age of these respondents was 44.77 (SD=13.8), the youngest being 14, the oldest being 83, the modal age being 39. In the Barking and Dagenham Active Sport for Life group (N=117 at Time 1) the average age of participants was 39.59 years (+/-13), In the Thurrock Active Sport for Life group (N=71 at Time 1), it was 49.37 years (+/-13.25). In the Barking & Dagenham Exercise on Referral group (N=55 at Time 1) the average age was 42 years (+/- 8.86). In the Thurrock Gym & Swim group (N=41 at Time 1) it was 55.59 years (+/- 13.27).

179 respondents (62%) self-designated as British, 37 (13%) self-designated as African, 20 (7%) as Caribbean, with the remaining 18% of the sample self-designating from various ethnic backgrounds (Indian, Bangladeshi, Irish, Pakistani). In terms of faith, 109 respondents (38%) specified christian, 16 (5.5%) muslim, while 34% (97) specified no religion. 264 respondents (91%) indicated that their main language was English.

At the beginning of the study, 88 of the participants (30%) had a body mass index of 25 to 28 (overweight), while 60 (21%) had a BMI of 28+ to 30, 110 (38%) had a BMI of 30+ to 40 (obese), and 31 (11%) had a BMI of 40+. Thereby, all of the participants in the study were classifiable as at least overweight at its start.

In terms of other health complaints, 31 (11%) reported having respiratory disorders at the start of the study, 48 (17%) suffered from hypertension, 20 (7%) suffered from Type 2 diabetes, 46 (16%) reported bone, joint or mobility problems, 20 (7%) reported hypercholesterolemia (high levels of blood-born low density lipoproteins, so called 'bad' cholesterol), 7 (2%) reported having coronary heart disease, and 61 participants (21%) reported mental health issues.

255 (88%) respondents reported that they had never smoked. The remaining 34 (12%) reported smoking from 1 to 38 years, the modal number of years being 10. When asked if they would like to be referred to a smoking cessation service, 265 (91%) declined the invitation. 188 (65%) reported that at some point in their life they had exercised regularly. On average resting heart rate was 77bpm (sd=13.64). 201 (70%) considered themselves to be without disability, whilst the remaining 30% self-designated as having a disability, including mental health issues, hearing impairment, restricted mobility, or learning difficulty.



Abbey Leisure Centre in Barking

II.III: Materials – our Questionnaires (what we measured)

Self-report measures were administered across the six time points of the study. At Time 1 all seven measures as listed below were administered. At Times 2 to Time 6 the third measure listed below (the PARQ) was excluded, it only being needed as a baseline measure – all other measures being repeated across these follow-up time points.

(1) International physical activity questionnaire IPAQ

The IPAQ short form by Craig, Marshall, Sjostrom et al (2003) asks about four specific types of activity, and sitting (sedentary behaviour): vigorous activities, moderate activities, walking, sport, and sitting. Questionnaire items measure the frequency (in days per week) and duration (time per day in minutes) of activity, with each of these being collected separately for each specific type of activity. The development of an international measure for physical activity started in Geneva in 1998 and was followed by extensive reliability and validity testing undertaken across 12 countries (and 14 sites) during 2000 and as reported by Craig et al (2003).

(2) The demographic questionnaire

This questionnaire asked respondents about their age in years, sex, their faith, their ethnicity and nationality, any disability, their main language and how they heard about Active sport for life / Exercise on Referral ASfL/EOR.

(3) Physical Activity Readiness Questionnaire (PARQ)

The PARQ was developed by Scott et al (1992) and asks respondents about the frequency of pre-existing physical symptoms such as heart trouble, spells of severe dizziness, chest pain, high blood pressure, and asthma. Respondents indicated an answer for each on a 4 point

rating from (1= never, 2 = sometimes, 3= often, 4 = very often). Respondents also indicated whether or not they suffered from Chronic Obstructive Pulmonary Disease, from bone or joint problems such arthritis or back pain (that may be aggravated by exercise), whether diabetic, and awareness of a family history of heart disease.

(4) Personal Health Questionnaire (PHQ)

As part of the Medical Outcomes Study (Ware & Sherbourne, 1992), RAND developed the 36-Item Short Form Health Survey (SF-36) as used here. From this form were selected two subscales: a six item subscale measure of physical health and a three item subscale measure of emotional problems (both scored in direction of health). Examples of items are: *'During the past 4 weeks how much did physical health problems limit your usual everyday physical activities (such as walking or climbing the stairs)';* and, *'during the past 4 weeks, how much have you been bothered by emotional problems (such as feeling anxious, depressed or irritable)'*. Participants are asked to indicate their responses on a 6 point rating for Question 1 and Question 2 (6 = Excellent, 5 = Very good, 4 = good, 3 = Fair, 2 = Poor, 1=Very poor), while for Questions 2, 3, 5, 6, 7, 8, 9 on a 5 point rating scale (5 = not at all, 4 = very little, 3 = some, 2 = Quite a lot, 1 = none).

(5) Well-Being Questionnaire (WBQ)

The WBQ was produced by the World Health Organisation (1998), initial results using the measure being reported by The World Health Organization Quality of Life Assessment (1998). The WBQ asks respondents how they have been feeling during the past 4 weeks, in terms of whether they have felt cheerful and in good spirits, calm and relaxed, active and vigorous, awaking feeling fresh and rested, and that daily life has been filled with things that are of interest. Participants are asked to indicate their responses on a 4 point rating from (1 = all of the time, 2 = most of the time, 3= some of the time, 4 = at no time).

(6) Loneliness Questionnaire

This brief measure consisted of three items developed by Hughes et al (2004): *'I feel I lack companionship'*, *'I feel left out'*, and *'I feel isolated from others'*. Respondents are asked to indicate the extent to which they think each item applies to them on a 4 point rating from (1 = all of the time, 2 = most of the time, 3= some of the time, 4 = at no time)

(7) Motivation Questionnaire

A motivation questionnaire was included which was assembled by LBBD and cannot be attributed to a sole source. Respondents were asked questions as follows: *'Taking part in the Active Sport 4 Life/ Exercise on Referral (EOR) will ...'* (i) *'help me to feel in good physical shape'*, (ii) *'help me to improve my health'*, (iii) *'help me to improve my overall wellbeing'*, (iv) *'help me to feel a sense of achievement'*, (v) *'help me to perform daily functional jobs and tasks'*, (vi) *'mean I can get out of the house and meet new people'*, (vii) *help me lose or control my weight'*. Respondents indicated their agreement/disagreement with each item on a 5 point rating scale (1 = strongly agree, 2 = agree, 3 = not sure, 4 = disagree, 5 = strongly disagree). An exploratory factor analysis of these seven items indicated that they comprise one factor.

II.IV: Procedure – what we did

Participants in the study were entered into either the Active Sport for Life (AS4L) programme, the Exercise on Referral programme and Gym/ Swim located in the boroughs of Barking & Dagenham and Thurrock. Active Sport for Life participants were run in both of the boroughs. Exercise on Referral participants were run only in Barking & Dagenham, while Gym&Swim participants occurred only in Thurrock.

The Active Sport for life programme was designed to help people get fit and lose weight by taking up Sport. This programme was available to people who were not taking part in any regular exercise, who were at least 14 years of age and who had a body mass index (BMI) of 28 or more. Participants were referred by their GP or self-referred. The expected benefits for participating in this programme were: reducing risks of coronary heart disease, weight loss, reducing stress and anxiety, strengthening muscles, better social life, having fun and improving quality of life and overall health.



Jim Peters Stadium in Dagenham

The AS4L programme in Barking & Dagenham was advertised as a free twelve week programme. Thereafter subsequent sessions were advertised as costing £2 each for the ensuing nine months, with six different sport sessions being offered: cycling outdoors or running outdoors at the Jim Peters Stadium, dance at an indoor studio in Abbey Leisure Centre, and either swimming, indoor walking football, or indoor boxercise at the Becontree Heath Leisure Centre (all three of which were run by instructor Nicola). Other instructors were also involved: Georgina ran the swim fit, Tony the cycling, and Barbara, Jason and Marilyn the swimming. Notably four out of the six classes in the Barking & Dagenham AS4L programme took place indoors. In the delivery of the Barking & Dagenham AS4L programme, however, participants in fact received the first twelve months of their involvement for free. There was no consequence for non-attendance after initial enrolment.



Participants in a Barking & Dagenham ASfL walking football session, with instructor Nicola

The AS4L programme in Thurrock was also advertised as a free 12 week programme, with subsequent sessions being advertised as costing £2 each for the ensuing 9 months, a charge which was levied. The following sports sessions were offered; indoor karate at William Edwards school, indoor netball at Hassenbrook school, outdoor rugby at Thurrock Rugby club, indoor swimming at both Blackshots Leisure Centre and Belhus Leisure Centre, indoor judo or outdoor 'fun fitness' at the Community Resource Centre, and indoor & outdoor dance or 'shrink my body mass index' at Blackshots Leisure Centre. Notably in the Thurrock AS4L programme activities were fairly evenly distributed across indoors and outdoors. Instructor Dean oversaw the AS4L programme in Thurrock. Instructor Trevor was involved mostly in the delivery of the outdoor activities. Other instructors were Danny and Daniel at the Martial Academy who taught the Functional Fitness Classes. There was no consequence for non-attendance after initial enrolment. Referrals into the AS4L Thurrock programme came from those enrolled on pre-existing Thurrock health programmes: 'Vitality Health' – one off talks about the health benefits of exercise; two adult weight management groups; and 'Therapy 4 You'. This resulted in 328 initial appointments and Time 1 assessments, 70% of which were from 'Vitality Health'.



A Thurrock relaxation class

The Exercise on Referral programme was an initial 12 week programme delivered in the borough of Barking & Dagenham. In order to ensure that people kept their place on this programme, they had to attend at least two sessions per week. At the start of the programme participants were informed that successful completion of the initial three months would lead to participants receiving a free Leisure Centre membership for another 9 months. Receipt of this membership allowed participants to use the gym, swimming pool and take part in exercise classes and racket sports. To enter the programme, participants needed to be referred by their GP, the criterion for referral being a BMI of 30 or more. To able to maintain the free membership people had to take part in a minimum of 150 minutes of exercise each week. All of these activities took place at Abbey Leisure Centre and Becontree Heath Leisure Centre. The gym Instructors were, Pete, Barbara, Jason, Peter and others.



Becontree Heath Leisure Centre

The Gym&Swim programme in the borough of Thurrock was a free 12 week programme, followed by a cost of £2 per session for the ensuing 9 months – a charge which was levied. Uniquely, this programme included sport (in the form of swimming) and exercise (in the form of gym-based activity). All participants attending this programme used both the gym and swimming pool. This programme was available to people who did not previously take part in any regular exercise and who were a minimum age of 14 and had a BMI of 28 or more.



Swimming pool in Thurrock



Blackshots Leisure Centre

At the beginning of the study, all of the participants were presented with an invitation letter which informed them about the general purpose of the research as an evaluation of the effects of physical activity. If agreeable to taking part, the participants were asked to sign a consent form. Thereafter, all participants in the four interventions were invited to attend for an initial assessment ('Time 1') in a one to one session, in a quiet setting (see Appendix I, page 62-76). The initial assessments however took place in different settings (as above) on different days and lasted approximately 60 minutes. After completion of the initial assessment, each

participant was told more about the specific purpose of the study, specifically as a comparison of the effects of sport and exercise. Participants were given the opportunity to ask questions they may have had about the research and were reminded that they could have their data removed from the study at any time if they wished so.

After the initial assessments, the participants were provided with leaflets which contained information about the activity classes (dates, times and venues) which they could attend within their specific programme. The sessions were run throughout the week, during the day and evening. After the initial assessment, follow-up assessments occurred at 6, 12, 24, 36, and 48 weeks, each lasting approximately 20 minutes. These follow-up assessments were presented to participants as 'reviews'. Each participant's questionnaire assessment was allocated a unique Identity Number to ensure anonymity and confidentiality.

III: Results – the data & what we found

III.I Our sample

Table 1 shows the numbers of participants across interventions and boroughs who responded at each of the six time points to the study questionnaire. These figures are expressed as totals (in red) and by gender (male = blue, female = green).

	T1	T2	T3	T4	T5	T6
Barking and Dagenham (AS4L)	118 Total	79 T	83 T	51 T	34 T	15 T
	26 Male	17 M	17 M	12 M	10 M	4 M
	92 Female	62 F	66 F	39 F	24 F	11 F
Thurrock (AS4L)	70 T	62 T	61 T	11 T	2 T	0 T
	20 M	18 M	15 M	2 M	0 M	0 M
	50 F	44 F	46 F	9 F	2 F	0 F
Barking and Dagenham Exercise	56 T	56 T	55 T	57 T	55 T	23 T
	14 M	14 M	13 M	15 M	14 M	6 M
	42 F	42 F	42 F	42 F	41 F	17 F
Thurrock Gym/Swim	42 T	42 T	40 T	8 T	0 T	0 T
	14 M	14 M	13 M	2 M	0 M	0 M
	28 F	28 F	27 F	6 F	0 F	0 F

Table 1: Total number of respondents at each time point (T1-T6), males and females, for the four activity sub-groups.

As can be seen from Table one, the distribution of respondents across interventions, boroughs and time points make five sets of comparisons viable statistically:

- (1) Barking & Dagenham Active Sport for Life vs Barking & Dagenham Exercise on Referral
- (2) Thurrock Active Sport for Life vs Barking & Dagenham Exercise on Referral
- (3) Barking & Dagenham plus Thurrock Active Sport for Life with Barking & Dagenham Exercise on Referral
- (4) Thurrock Active Sport for Life vs Thurrock Gym&Swim
- (5) Barking & Dagenham Active Sport for Life vs Thurrock Active Sport for Life participants.

The first, second and third comparisons wherein Active Sport for Life participants are compared with Exercise only participants directly address the central concerns of the study as proposed to and funded by Sport England.

III.II Comparing Barking & Dagenham Active Sport for Life respondents and Barking & Dagenham Exercise on Referral participants

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Time 4 (6 months)		Time 5 (9 months)		Time 6 (12 months)		Main effect, time f	Main effect, group f	Interac tion Group x time f
	ASfL	EoR	ASfL	EoR	ASfL	EoR	ASfL	EoR	ASfL	EoR	ASfL	Eor			
Vigorous exercise (mins)	.76 (2.7)	54.6 (131.6)	50.7 (103.4)	137.9 (103.4)	103.1 (157.7)	138.6 (187.7)	38.4 (75.03)	17.7 (36.6)	46.1 (77.1)	40.9 (52.8)	79.6 (145.8)	53.6 (114.6)	3.44 (.016)	1.14 (NS)	1.23 (NS)
Moderate exercise (mins)	.77 (3.8)	45.5 (102.8)	33.8 (86.5)	145.4 (231.7)	198.1 (357.4)	119.5 (144.7)	62.31 (119.0)	78.2 (123.4)	61.5 (98.1)	61.1 (67.2)	175.3 (423.6)	162.0 (212.3)	3.12 (.030)	.18 (NS)	.95 (NS)
Walking (mins)	254.2 (273.8)	245.5 (286.6)	203.1 (277.2)	249.2 (251.5)	276.2 (246.1)	280.8 (258.6)	148.1 (93.2)	349.2 (387.40)	230.6 (247.3)	306.5 (346.50)	255.0 (301.2)	426.5 (495.1)	.61 (NS0)	1.57 (NS)	.73 (NS)
Sport (mins)	.000 (.000)	16.3 (46.7)	4.6 (16.6)	28.7 (84.60)	61.5 (85.0)	87.8 (167.8)	79.6 (89.8)	1.7 (8.3)	165.0 (279.6)	.000 (.000)	91.5 (63.1)	8.6 (29.4)	3.24 (.032)	6.94 (.013)	5.50 (.003)
All exercise (mins)	255.8 (272.7)	384.5 (439.9)	287.6 (404.3)	502.3 (459.6)	377.3 (541.7)	556.1 (537.6)	248.8 (196.2)	416.7 (474.0)	347.3 (318.1)	425.2 (345.5)	510.0 (704.2)	702.1 (651.8)	2.36 (NS)	1.73 (NS)	.302 (NS)
All activities (mins)	255.7 (272.6)	396.0 (447.7)	292.3 (401.1)	530.5 (522.0)	638.8 (562.2)	657.3 (650.4)	328.4 (224.4)	419.1 (472.6)	512.3 (533.3)	425.2 (345.5)	601.5 (673.6)	713.8 (668.1)	2.75 (.038)	.687 (.041)	.424 (NS)
Physical health	23.7 (5.1)	25.5 (3.8)	21.6 (5.5)	26.0 (3.3)	24.7 (5.1)	25.9 (4.0)	21.4 (4.8)	24.5 (4.0)	24.7 (4.4)	24.6 (5.5)	27.2 (3.4)	26.1 (4.8)	3.01 (.022)	2.19 (NS)	1.86 (NS)
Emotional problems	12.3 (3.3)	12.1 (3.2)	13.0 (2.6)	12.9 (2.90)	13.7 (1.6)	12.6 (3.3)	11.7 (2.9)	12.8 (2.4)	13.1 (2.7)	13.65 (1.67)	14.0 (1.4)	13.6 (2.1)	2.01 (NS)	.000 (NS)	.713 (NS)
Well being	11.9 (6.6)	10.71 (7.1)	19.2 (10.8)	14.5 (6.2)	13.7 (1.6)	12.9 (3.2)	13.5 (5.7)	10.7 (8.5)	16.4 (7.7)	15.47 (6.44)	17.7 (3.9)	19.6 (5.4)	5.49 (.001)	1.72 (NS)	.78 (NS)
Loneliness	3.7 (1.3)	4.9 (1.74)	3.7 (1.1)	4.4 (1.7)	3.2 (.46)	4.1 (1.8)	5.1 (4.1)	5.7 (7.5)	3.7 (1.3)	4.1 (1.9)	3.2 (.40)	3.4 (1.4)	1.74 (NS)	1.76 (NS)	.108 (NS)
Motivation	31.5 (3.9)	31.6 (3.2)	29.5 (5.40)	32.8 (4.2)	13.5 (4.5)	10.8 (2.9)	28.4 (4.5)	31.1 (2.9)	31.1 (4.3)	32.5 (3.7)	3.4 (.67)	3.4 (1.3)	346.5 (.001)	2.90 (NS)	2.67 (.045)

Table 2 : Results of repeated measures analysis of variance across six time points of the mean scores for physical activity (previous week), health and psychological variables for Barking & Dagenham Active Sport for Life (ASfL; N=13) and Exercise on Referral (EoR; N=22) participant groups.

Notable features of the data and statistical analysis shown in Table 2 include the observations that for four activity measures (*vigorous & moderate exercise*, *all activity*, and *sport*), for *physical health*, and for two psychological variables (*wellbeing* and *motivation*) there are statistically significant differences across the six time points, with notably duration of *sport*, *exercise* and *well-being* scores increasing relative to baseline (Time 1) over time, whether this be for Active Sport for Life or for Exercise On Referral participants. As to be expected, with regard to the effects of group membership on activity, participants in the Active Sport for Life group spent significantly more time engage in *sports* activity than did those in the Exercise on Referral group.

Looking at the correlations between variables measured at Time 1 and Time 6 in the Barking and Dagenham ASfL & EoR samples, it was found that two Time 6 variables were related to Time 1 scores on a number of predictor variables. These two Time 6 variables were diastolic blood pressure, and body mass index. To establish which Time 1 variables independently of each other predicted scores on these two Time 6 measures, regression analysis was undertaken¹. The results of these analyses showed firstly that no one Time 1 variable independently predicted Time 6 diastolic blood pressure and that for Time 6 body mass index membership of either the ASfL or EoR group independently predicted scores. Specifically in relation to the latter, membership of the ASfL condition at Time 1 (N=16) was found to be related to a higher body mass index on average (mean=34.86, +/- 4.73) at Time 6 than was membership of the Exercise on Referral condition (N=23) at Time 1 (mean=30.05, +/-7.04).

¹ In such regression analyses hereafter, also statistically controlled for were the effects of the dependent variable as measured at the first time-point by inclusion of it in two-step regression wherein the Time 1 version of the dependent variable was entered at the second step as a predictor variable.

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Time 4 (6 months)		Main ef- fect, time	Main ef- fect, group	Interaction Group x time
Groups	ASfL	EoR	ASfL	EoR	ASfL	EoR	ASfL	EoR	F	f	f
Vigorous exercise (mins)	4.22 (26.84)	30.60 (91.32)	71.33 (154.07)	109.00 (152.29)	89.11 (151.29)	116.45 (170.73)	41.44 (88.49)	64.45 (140.07)	11.3 (.001)	2.7 (NS)	.076 (NS)
Moderate exercise (mins)	19.56 (62.34)	29.45 (73.47)	48.67 (112.86)	118.43 (179.33)	126.44 (255.18)	125.41 (159.51)	81.33 (179.17)	108.00 (143.53)	8.9 (.001)	1.9 (NS)	1.19 (NS)
Walking (mins)	149.73 (196.11)	166.57 (213.52)	154.89 (221.83)	225.09 (219.14)	202.89 (213.32)	243.15 (219.27)	179.22 (196.10)	284.00 (319.17)	2.46 (NS)	4.08 (.46)	.793 (NS)
Sport (mins)	.000 (.000)	7.90 (31.21)	8.00 (24.27)	37.63 (89.45)	53.11 (102.24)	77.28 (153.85)	74.67 (113.22)	18.19 (59.41)	10.7 (.001)	.016 (NS)	5.8 (.003)
All exercise (mins)	173.51 (202.64)	234.05 (312.17)	274.89 (385.68)	432.32 (401.29)	418.44 (452.44)	489.05 (441.79)	302.00 (343.40)	444.26 (449.99)	9.7 (.001)	4.03 (.048)	.538 (NS)
All activities (mins)	173.51 (202.63)	239.85 (322.13)	282.89 (382.94)	475.08 (460.26)	471.56 (493.08)	575.28 (561.16)	376.67 (405.25)	464.78 (482.41)	11.9 (.001)	3.6 (NS)	.524 (NS)
Physical health	22.42 (5.10)	24.90 (4.46)	22.64 (5.33)	26.12 (3.67)	24.53 (6.19)	26.10 (4.43)	22.83 (4.07)	25.10 (4.16)	3.8 (.011)	9.6 (.003)	1.16 (NS)
Emotional problems	11.22 (3.66)	12.44 (2.96)	12.17 (3.04)	13.46 (4.55)	12.44 (2.99)	13.08 (2.72)	12.61 (2.72)	13.42 (3.16)	3.6 (.017)	5.4 (.023)	.73 (NS)
Well being	9.56 (6.78)	11.62 (6.75)	14.86 (8.82)	15.50 (6.44)	12.44 (2.99)	13.21 (2.75)	10.83 (9.29)	10.86 (8.20)	9.4 (.001)	1.05 (NS)	.38 (NS)
Loneliness	4.72 (1.85)	4.83 (1.77)	4.15 (1.58)	4.24 (1.68)	3.72 (.98)	3.91 (1.71)	5.12 (5.87)	4.69 (4.88)	2.8 (NS)	.002 (NS)	.212 (NS)
Motivation	30.92 (6.06)	31.09 (3.94)	31.07 (3.95)	31.57 (3.94)	11.75 (4.22)	10.13 (2.62)	30.25 (4.22)	31.87 (2.62)	5.3 (.001)	.000 (NS)	2.28 (NS)

Table 3: Mean scores for physical activity (previous week), health and psychological variables for Barking & Dagenham Active Sport for Life (ASfL; N=45) exercise on Referral (EoR; N=55) participant groups at four time points

Ex-

Notable features of the data and statistical analysis shown in Table 3 include the observations that for five activity measures (*vigorous, moderate exercise, sport, all exercise* and *all activity*), for *physical health* and for two psychological variables (*wellbeing* and *motivation*) there are statistically significant differences across the four time points, with notably duration of *sport, exercise, physical health, well-being* and *motivation* scores increasing relative to baseline (Time 1) over time, whether this be for Active Sport for Life or for Exercise On Referral participants.

With regard to the effects of group membership on exercise, participants in the Exercise on Referral group spent significantly more time engaged in *walking* and *all exercise* than did those in the Active Sport for Life group. This is so at all four time points.

With regard to the effects of group membership on physical health, looking at the scores here, it is apparent that self-reported physical health appears to improve slightly over time in the EoR group, but remains similar over time for ASfL participants. This appears also to be the case for emotional problems. Both of these trends need to take account of baseline scores (ie at Time 1), something which is considered in regression analyses reported below (see page 24).

In terms of the interaction between group membership and progression of activity over time, participants in the ASfL group by Time 4 are reporting spending significantly more time in such activity than those in the EoR group, as would be expected. This is not the case at Times 2 and 3, given the zero level of sport engagement at baseline (Time 1) among those referred to ASfL intervention.

Some of these notable differences across time points and intervention conditions are represented visually in the following four bar charts.

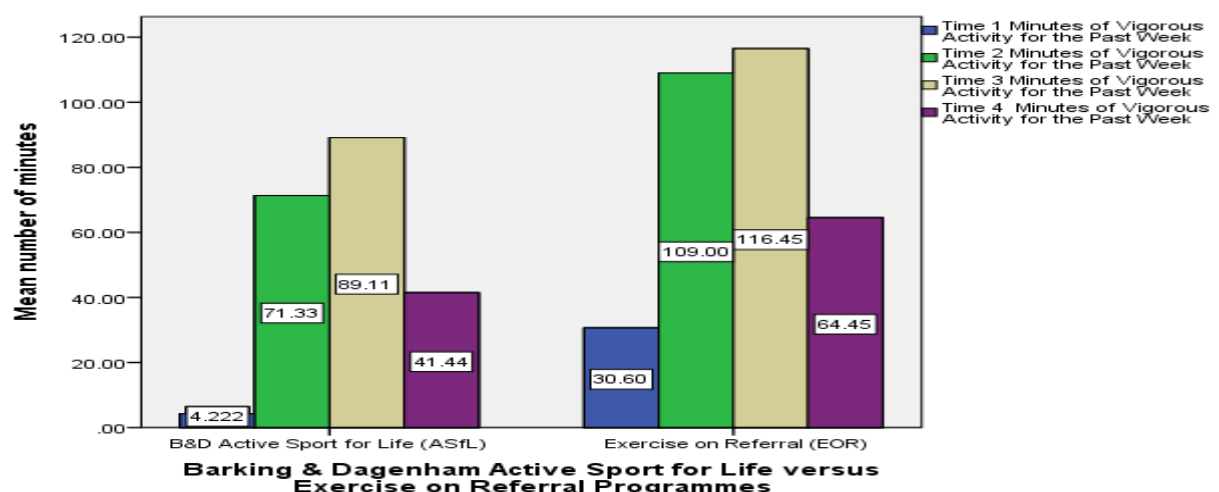


Figure 1: Bar chart of the average number of minutes in the previous week spent in vigorous activity at baseline, six weeks, twelve weeks and six months for Barking & Dagenham (B&D) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

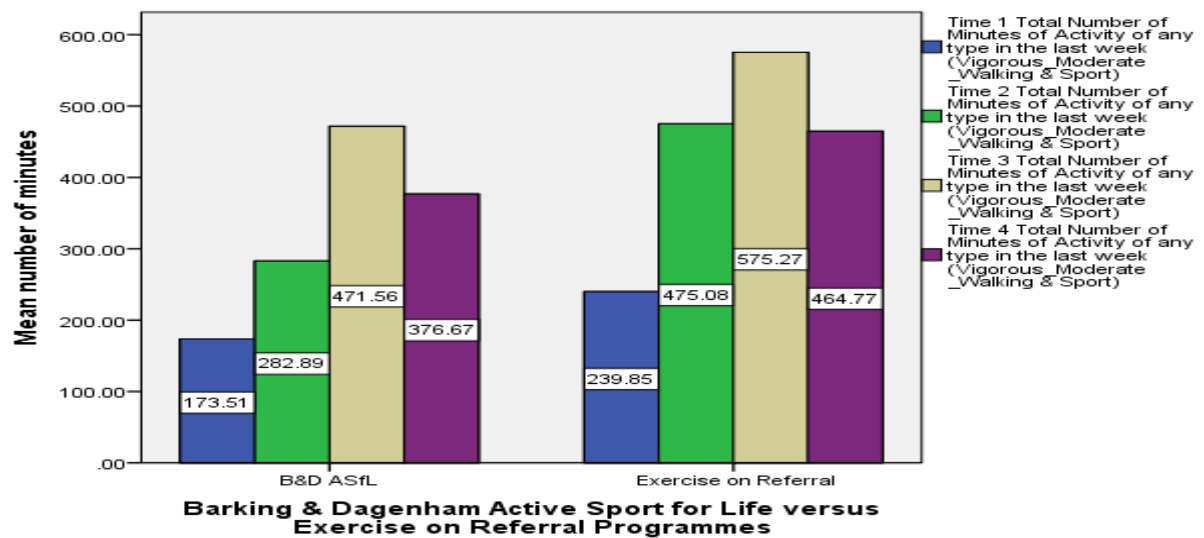


Figure 2: Bar chart of the average number of minutes in the previous week spent in all activity (vigorous, moderate, walking & sport) at baseline, six weeks, twelve weeks and six months for Barking & Dagenham (B&D) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

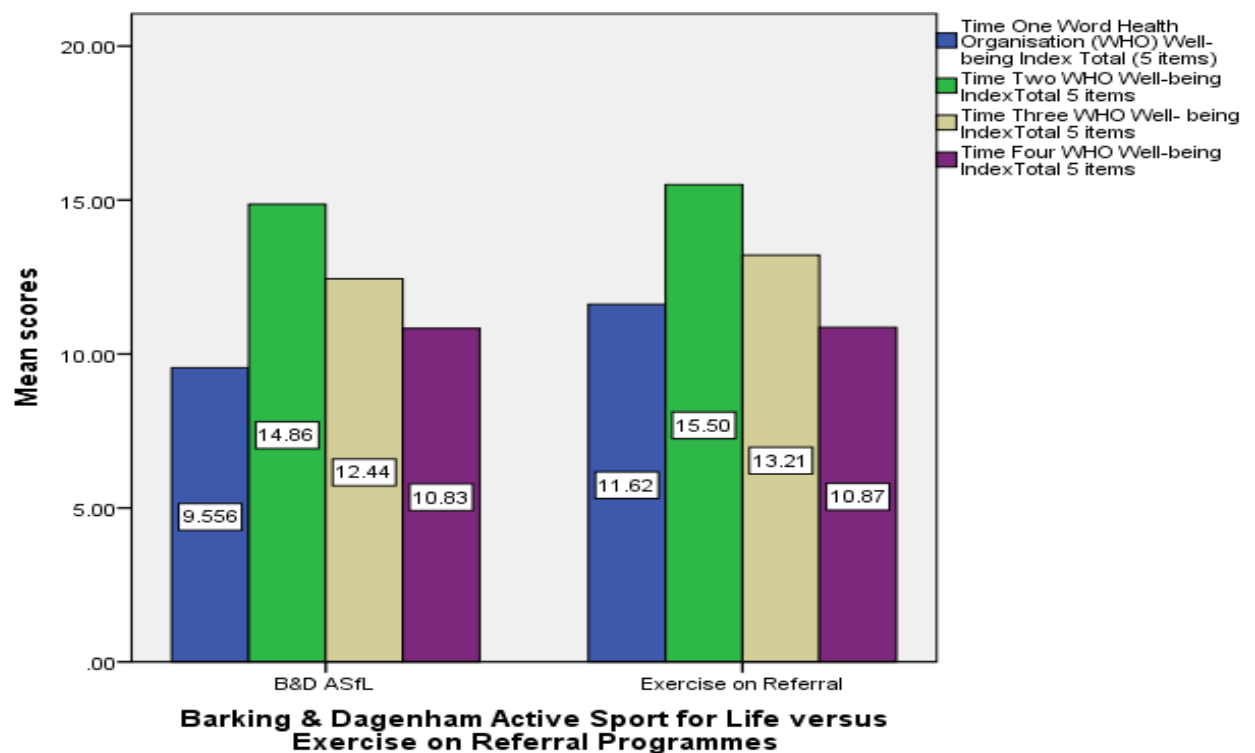


Figure 3: Bar chart of the mean scores measuring well-being in the past four weeks at baseline, six weeks, twelve weeks and six months for Barking & Dagenham (B&D) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

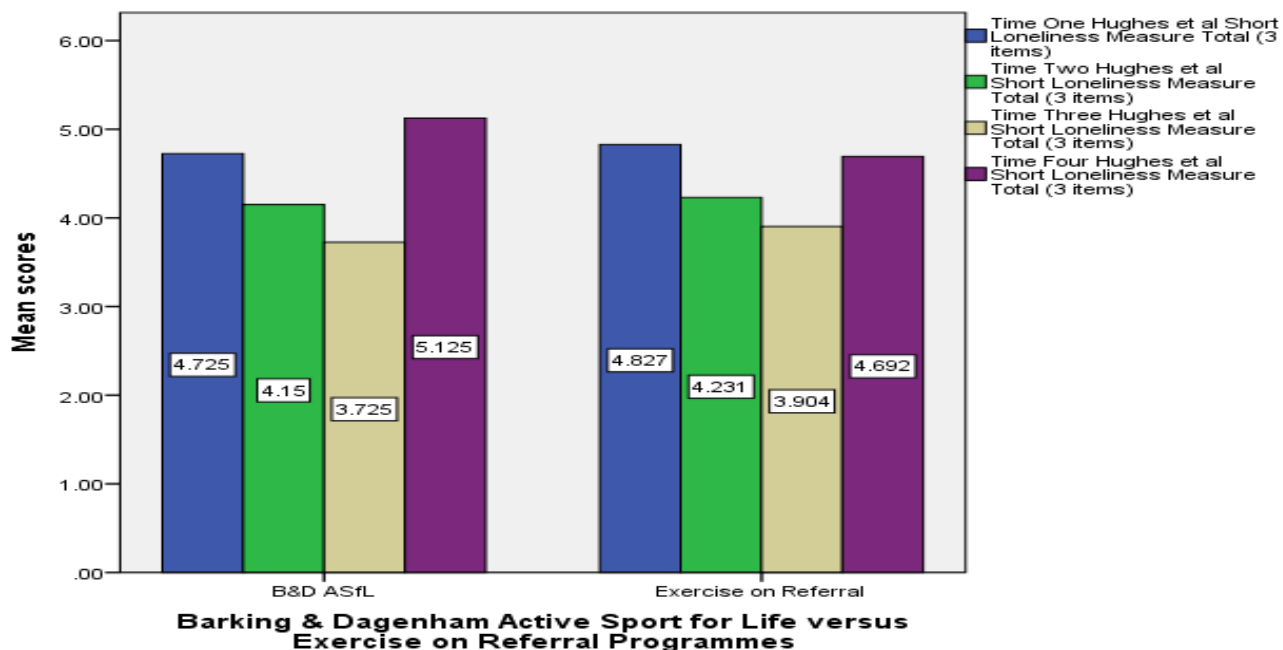


Figure 4: Bar chart of the mean scores measuring loneliness in the past four weeks at baseline, six weeks, twelve weeks and six months for Barking & Dagenham (B&D) participants in the Active Sport for Life (ASfL) and Exercise on Referral (EOR) programmes

Looking at the bivariate correlations between variables measured at Time 1 and Time 4 in the Barking & Dagenham ASfL & EoR samples, it was found that various predictor variables at Time 1 were related to seven different Time 4 outcome measures. To establish which Time 1 variables independently of each other predicted scores on these Time 4 measures, two-stage regression analyses were undertaken, including the Time 1 equivalent of the dependent variable as an independent variable at the second stage. The results of these analyses in summary are as follows:

- For Time 4 points, moderate activity (minutes last week), it was found that Body Mass Index ($B = -.22$, $t = -.2.4$, $p = .020$), was an independent predictors, accounting collectively for 11% of the variance ($r^2 = .11$)
- For Time 4 points, sport activity (minutes last week), it was found that group variable (ASfL Barking and Dagenham vs EoR, B&D), ($B = -.270$, $t = -2.9$, $p = .005$), and resting heart rate ($B = -.263$, $t = -2.9$, $p = .005$) were independent predictors, accounting collectively for 17% of the variance ($r^2 = .17$)
- For Time 4 points, PHQ Physical health it was found that Group variable (ASfL Barking and Dagenham vs EoR, B&D), ($B = .24$, $t = 2.5$, $p = .013$) was an independent predictors, accounting collectively for 9% of the variance ($r^2 = .09$)

- For Time 4 points, motivation it was found that walking (minutes last week), ($B = -.21$, $t = -2.1$, $p = .037$), was an independent predictors, accounting collectively for 17% of the variance ($r^2 = .17$)
- For Time 4 points, number of cigarettes, it was found that number of cigarettes(Time 1) ($B = .55$, $t = 6.2$, $p = .001$), was an independent predictors, accounting collectively for 34% of the variance ($r^2 = .34$)
- For Time 4 points, systolic blood pressure it was found that age in years ($B = .19$, $t = 2.1$, $p = .031$), and systolic BP (Time1), ($B = .49$, $t = 3.7$, $p = .001$) were independent predictors, accounting collectively for 38% of the variance ($r^2 = .38$)
- For Time 4 diastolic blood pressure, it was found that loneliness ($B = .21$, $t = 2.3$, $p = .021$), and diastolic BP (Time 1) ($B = .45$, $t = 3.5$, $p = .001$) were independent predictors, accounting collectively for 30% of the variance ($r^2 = .30$)

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Time 4 (6 months)		Time 5 (9 months)		Time 6 (12 months)		Main effect, time f	Main effect, group f	Interaction Group x time f
	ASfL	EoR	ASfL	EoR	ASfL	EoR	ASfL	EoR	ASfL	EoR	ASfL	Eor			
Body Mass Index (BMI)	36.9 4.8	32.3 7.0	35.9 5.1	31.9 7.1	36.1 4.8	31.2 6.9	36.1 4.7	30.5 6.9	36.4 4.1	30.3 7.1	35.9 4.8	30.0 7.2	1.7 NS	6.5 .015	2.2 NS
Systolic BP	122.2 14.3	125.9 16.7	120.1 16.3	123.7 12.3	122.4 13.8	124.7 12.4	123.8 15.9	122.3 12.7	127.4 19.6	124.3 12.7	121.7 11.9	119.9 15.8	1.30 NS	.017 NS	1.04 NS
Diastolic BP	83.2 10.5	85.3 8.4	78.0 12.1	83.9 7.6	83.4 8.4	84.6 6.7	78.5 8.3	83.3 6.9	78.7 10.6	83.4 6.9	77.4 7.0	80.6 6.0	3.8 .007	2.6 NS	.73 NS
Resting heart rate	73.4 23.2	76.1 15.8	72.9 10.8	78.5 11.9	75.7 8.5	77.1 9.1	76.4 12.0	76.1 7.3	78.2 13.2	78.0 8.2	73.2 10.7	76.0 6.1	.46 NS	.78 NS	.35 NS
Number of units of alcohol	.53 1.4	2.4 6.3	.46 1.7	1.3 3.3	.76 2.7	.36 1.3	.46 1.7	.00 .00	.76 2.7	.04 .21	.00 .00	.00 .00	1.4 NS	.15 NS	1.2 NS
Number of cigarettes	3.9 8.9	1.3 3.6	2.3 8.3	.45 1.47	.00 .00	.45 2.1	2.8 8.2	.00 .00	1.5 5.4	.04 .21	1.5 3.7	.00 .00	2.8 NS	1.9 NS	1.4 NS

Table 4: Mean scores for BMI, Systolic BP, Diastolic BP, Resting heart rate, number of units of alcohol and number of cigarettes for Barking & Dagenham Active Sport for Life (ASfL; N=12) and Exercise on Referral (EoR; N=22) participant groups at six time points.

In Table 4 only one statistically significant difference is notable (at $p<.05$), specifically with regard to the effects of group membership on *BMI*: in the EoR group at all four time points participant's BMI is less on average than for those in the ASfL intervention. Notably, EoR participants start their programme with a healthier BMI than those referred to the ASfL programme.

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Time 4 (6 months)		Main effect, time f	Main effect, group f	Interaction Group x time f
	ASfL	EoR	ASfL	EoR	ASfL	EoR	ASfL	EoR			
BMI	34.2 5.6	32.6 6.5	33.6 5.6	33.2 10.6	33.5 5.6	31.7 6.2	33.8 5.6	30.5 6.3	3.5 .049	1.7 NS	3.4 .054
Systolic BP	119.2 14.3	124.8 19.0	123.5 16.4	122.5 15.4	123.6 13.4	123.0 15.8	123.7 14.3	120.8 14.9	.44 NS	.011 NS	4.0 .010
Diastolic BP	79.4 9.1	83.2 10.6	80.3 10.8	81.9 8.9	82.0 11.6	82.8 9.1	79.5 10.1	80.9 9.4	1.6 NS	1.3 NS	.83 NS
Resting heart rate	76.1 15.5	76.0 12.7	78.6 11.9	76.7 12.3	77.5 10.8	77.3 17.6	77.3 10.7	75.1 8.6	.46 NS	.37 NS	.24 NS
Number of units of Alcohol	.82 2.7	1.5 4.5	.84 3.2	.61 2.3	.88 3.4	.71 2.2	.80 3.8	.41 1.9	.78 NS	.010 NS	.97 NS
Number of cigarettes	2.4 6.5	.76 2.7	2.5 10.3	.36 1.26	.38 1.9	.49 1.9	.97 4.6	.00 .00	1.9 NS	2.8 NS	1.2 NS

Table 5: Mean scores for BMI, Systolic BP, Diastolic BP, Resting heart rate, number of units of alcohol and number of cigarettes for Barking & Dagenham Active Sport for Life (ASfL; N=43) and Exercise on Referral (EoR; N=47) participant groups at four time points.

In Table 5 *Body Mass Index (BMI)* showed statistically significant difference (at $p < .05$) across the four time points. Notably, EoR participant's BMI decreases over time and is less than that of those in the ASfL intervention, wherein BMI remains mostly at the same level. However, no significant effect of group membership is observed. For systolic blood pressure a significant interaction of group and time is noted, though no main effect of either: specifically, average systolic blood pressure tends to decrease over time in the EoR group but not in the ASfL group wherein it increases to Time 2 and thereafter remains at the same level.

III.III Comparing Thurrock Active Sport for Life and Barking & Dagenham Exercise on Referral participants

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Main effect, time	Main effect, group	Interaction Group x time
Groups	ASfL TH	EoR	ASfL TH	EoR	ASfL TH	EoR	f	f	F
Vigorous exercise (mins)	1.50 (7.69)	30.60 (91.32)	44.52 (72.58)	109.00 (152.39)	100.66 (159.10)	116.45 (170.73)	19.02 (.001)	5.15 (.025)	1.36 (NS)
Moderate exercise (mins)	27.35 (64.82)	29.45 (73.47)	55.28 (115.10)	118.43 (179.53)	46.69 (78.91)	125.41 (159.51)	10.27 (.001)	9.28 (.003)	3.75 (.029)
Walking (mins)	131.16 (158.75)	166.57 (213.52)	186.37 (183.98)	225.09 (219.14)	181.68 (187.88)	243.13 (219.27)	3.67 (.027)	3.10 (NS)	.152 (NS)
Sport (mins)	3.39 (24.72)	7.90 (31.21)	106.41 (145.49)	37.63 (89.45)	87.46 (92.45)	77.28 (153.85)	19.45 (.001)	4.06 (.046)	4.22 (.020)
All exercise (mins)	161.16 (171.05)	234.05 (312.17)	280.09 (208.03)	432.32 (401.29)	331.27 (268.78)	489.05 (441.79)	16.48 (.001)	8.26 (.005)	.761 (NS)
All activities (mins)	164.68 (172.67)	239.85 (322.13)	401.27 (261.31)	475.08 (460.26)	419.80 (286.10)	575.28 (561.16)	22.94 (.001)	4.06 (.047)	.514 (NS)
Physical health	26.18 (3.16)	24.90 (4.46)	27.04 (3.10)	26.12 (3.68)	27.02 (3.96)	26.56 (4.20)	5.18 (.008)	2.65 (NS)	.840 (NS)
Emotional problems	12.19 (2.95)	12.44 (2.95)	12.78 (3.10)	13.96 (4.54)	13.02 (2.99)	13.08 (2.82)	5.65 (.005)	.865 (NS)	1.69 (NS)
Well being	11.44 (6.09)	11.61 (6.75)	13.71 (6.31)	15.50 (6.43)	12.91 (3.05)	13.21 (2.75)	13.87 (.001)	.812 (NS)	1.18 (NS)
Loneliness	4.63 (3.53)	4.83 (1.77)	4.16 (1.72)	4.24 (1.68)	3.91 (1.56)	3.91 (1.71)	6.17 (.005)	.092 (NS)	.096 (NS)
Motivation	29.80 (3.53)	31.09 (3.94)	31.00 (2.99)	31.57 (3.94)	17.30 (12.81)	10.13 (2.62)	162.05 (.001)	3.95 (.052)	9.07 (.001)

Table 6: Mean scores for physical activity (previous week), health and psychological variables for Thurrock Active Sport for Life (ASfL; N=53) Exercise on Referral (EoR; N=55) participant groups at three time points

In Table 6 the statistical analyses show that for six activity measures (*vigorous & moderate exercise, walking, sport, all activity, and all exercise*), for *physical health*, and for three psychological variables (*wellbeing, loneliness and motivation*) there are statistically significant differences across the three time points, with notably duration of sport, exercise scores increasing relative to baseline (Time 1) over time, whether this be for ASfL or for EoR participants.

As to be expected, with regard to the effects of group membership on activity, participants in the ASfL group spent significantly more time engaged in sports activity than did those in the EoR group. Similarly, for effects of group membership on *all exercise*, participants in the EoR group spent more time engaged in exercise such as vigorous and moderate exercise, as would be expected.

In terms of the interaction between group membership and progression of moderate exercise over time, participants in the EoR group by Time 2 are reporting spending a lot more time in such exercise than those in the ASfL group. In terms of the interaction between group membership and progression of sport over time, participants in the ASfL group by Time 2 are reporting spending significantly more time in such activity than those in the EoR group, as would be expected.

Some of these key differences over time points and between groups are illustrated visually in the following four bar charts.

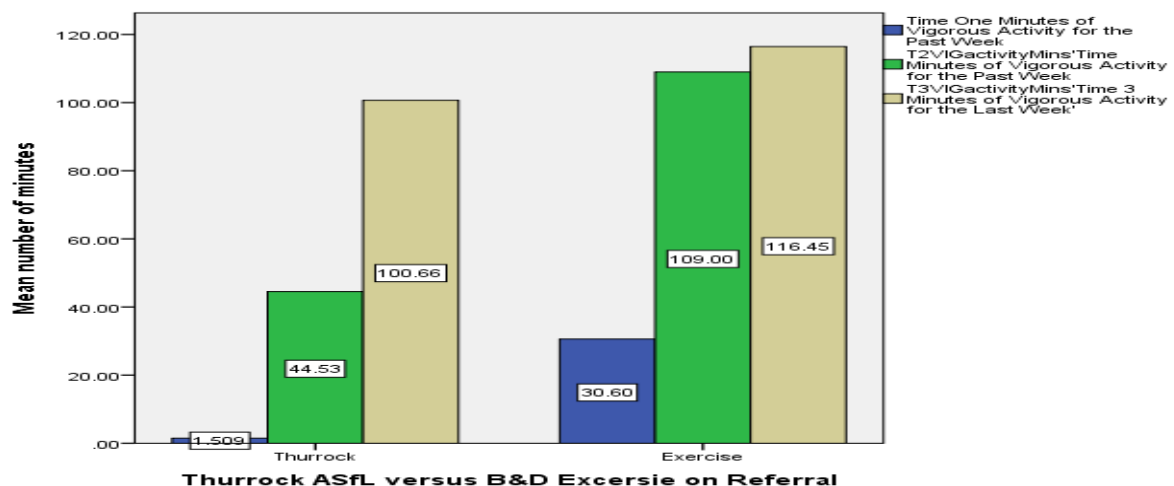


Figure 5: Bar chart of the average number of minutes in the previous week spent in vigorous activity at baseline, six weeks and twelve weeks for Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

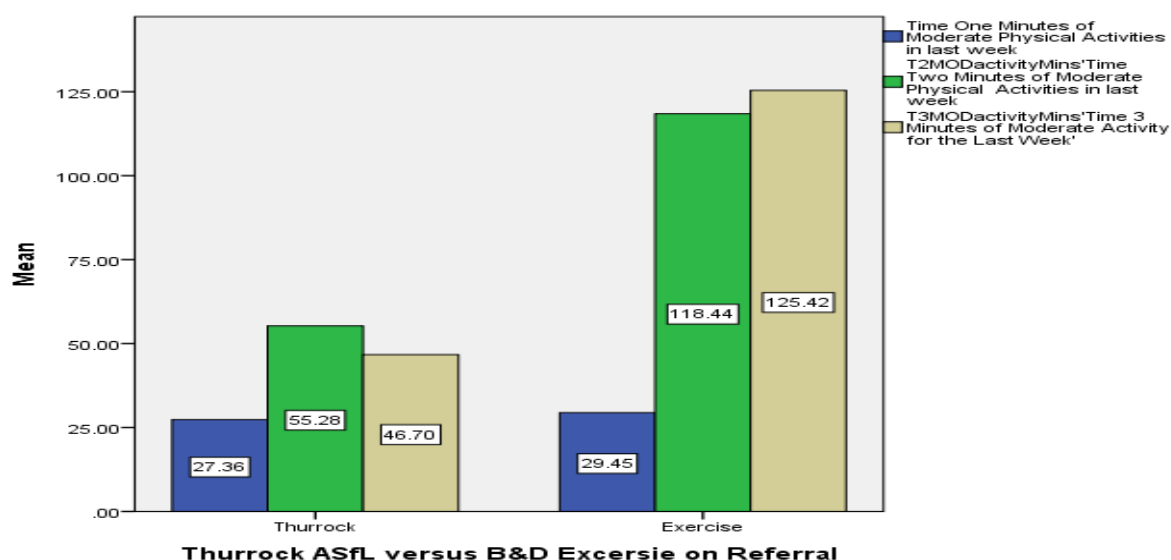


Figure 6: Bar chart of the average number of minutes in the previous week spent in moderate activity at baseline, six weeks and twelve weeks for Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

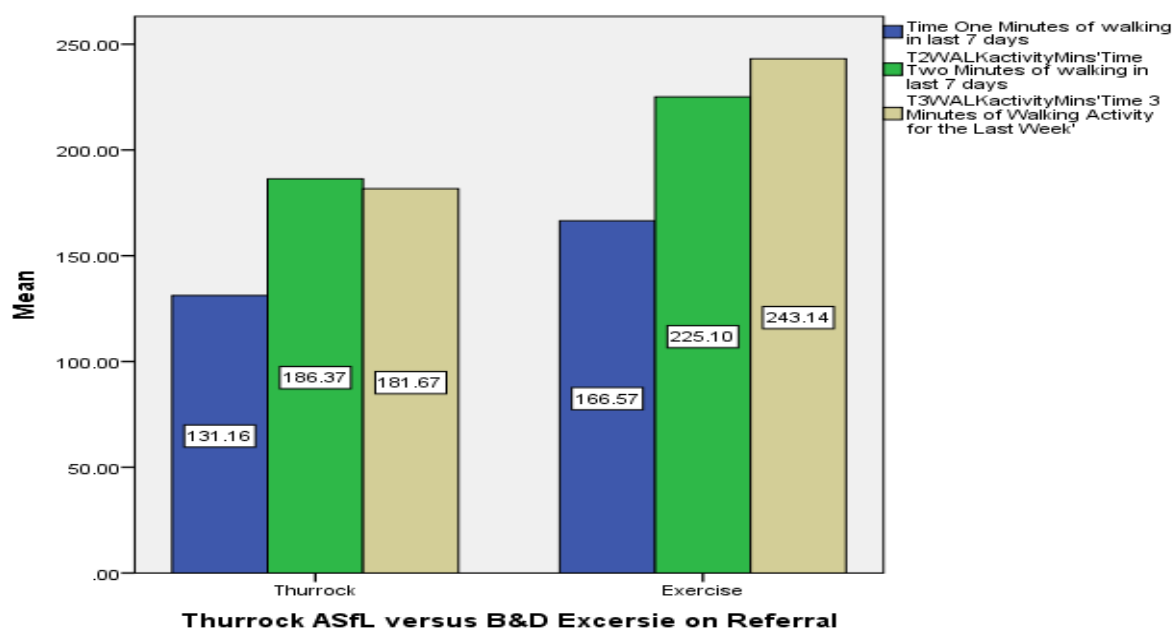


Figure 7: Bar chart of the average number of minutes in the previous week spent in walking at baseline, six weeks and twelve weeks for Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

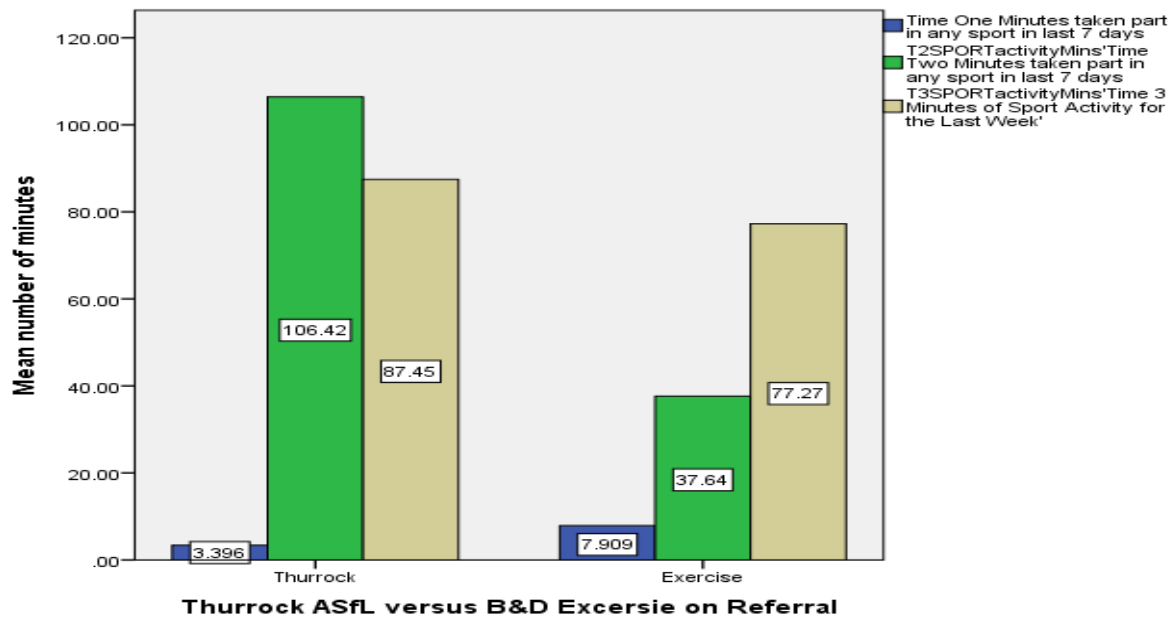


Figure 8: Bar chart of the average number of minutes in the previous week spent in sport at baseline, six weeks and twelve weeks for Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

Looking at the correlations between variables measured at Time 1 and Time 3 in the Thurrock ASfL & Barking and Dagenham EoR samples, it was found that various predictor variables at Time 1 were related to eight different Time 3 outcome scores. To establish which Time 1 variables independently of each other predicted scores on these Time 3 measures, regression analyses were undertaken. The results of these analyses in summary are as follows:

- For Time 3 points, All exercise (minutes last week), it was found that Thurrock Active Sport for Life (ASfL) vs. Exercise on Referral ($B = .188$, $t = 2.9$, $p = .039$), Moderate exercise ($B = .19$, $t = 2.1$, $p = .035$) and PARQ ($B = .21$, $t = 2.2$, $p = .027$) were independent predictors, accounting collectively for 15% of the variance ($r^2 = .15$)
- For Time 3 points, All activities (minutes last week), it was found that PARQ ($B = .21$, $t = 2.3$, $p = .023$), and Systolic BP ($B = -.22$, $t = -2.4$, $p = .020$) were independent predictors, accounting collectively for 13% of the variance ($r^2 = .13$)
- For Time 3 points, PHQ physical health, it was found that Well Being ($B = .45$, $t = 5.6$, $p = .001$), Motivation ($B = .17$, $t = 2.2$, $p = .031$) and number of units of Alcohol ($B = -.23$, $t = -2.8$, $p = .006$) were independent predictors, accounting collectively for 38% of the variance ($r^2 = .38$)
- For Time 3 points, Well Being, it was found that Motivation ($B = .18$, $t = 2.2$, $p = .026$), was independent predictor, accounting collectively for 41% of the variance ($r^2 = .41$)
- For Time 3 points Hughes short Loneliness measure, it was found that, No of cigarettes ($B = .23$, $t = 2.7$, $p = .008$), and Diastolic BP ($B = -.20$, $t = -2.4$, $p = .018$)

were independent predictors, accounting collectively for 34% of the variance ($r^2=.34$)

- For Time 3 points, Systolic BP, it was found that Gender ($B = -.17$, $t = -1.9$, $p = .059$) and Diastolic BP ($B = .32$, $t = 3.6$, $p = .001$) were independent predictors, accounting collectively for 19% of the variance ($r^2=.19$)
- For Time 3 points, Diastolic BP it was found that Thurrock Active Sport for Life (ASfL) vs. Exercise on Referral ($B = .22$, $t = 2.6$, $p = .009$), and Systolic BP ($B = .47$, $t = 5.7$, $p = .001$) were independent predictors, accounting collectively for 28% of the variance ($r^2=.28$)
- For Time 3 points, Activity level in minutes per week, it was found that Thurrock Active Sport for Life (ASfL) vs. Exercise on Referral ($B = .29$, $t = 3.1$, $p = .002$), and Systolic BP ($B = .32$, $t = 3.5$, $p = .001$) were independent predictors, accounting collectively for 23% of the variance ($r^2=.23$)

In those regressions where group membership was found to be predictive, subsequent analysis of the means showed that membership of the B&D Exercise on Referral group conferred better outcomes at Time 3 than did membership of the Thurrock Active Sport for Life group, with both groups having improved over time. However, a qualification of this observed difference is that the EoR participants on average started at Time 1 with better health scores than their ASfL counterparts.

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Main effect, time f	Main effect, group f	Interaction Group x time F
	ASfL	EoR	ASfL	EoR	ASfL	EoR			
BMI	33.4 6.9	32.6 6.5	34.7 11.3	33.2 10.6	33.3 6.9	31.6 6.2	2.1 NS	.76 NS	.15 NS
Systolic BP	130.8 15.9	124.8 19.1	129.0 19.9	122.5 15.4	125.6 21.0	123.0 15.9	3.1 NS	2.4 NS	1.2 NS
Diastolic BP	82.0 10.4	83.2 10.6	81.7 10.6	81.5 8.8	78.8 10.8	82.8 9.1	2.2 NS	.90 NS	2.8 NS
Resting heart rate	75.4 13.2	76.0 12.6	75.5 11.5	76.7 12.3	73.8 12.2	77.3 17.6	.06 NS	.69 NS	.45 NS
Number of units of Alcohol	4.9 9.4	1.5 4.6	2.9 6.5	.61 2.3	4.0 7.8	.71 2.3	2.1 NS	10.5 .002	.41 NS
Number of cigarettes	1.8 10.2	.76 2.7	.31 1.69	.36 1.26	.24 1.4	.49 1.9	1.29 NS	.14 NS	.52 NS

Table 7: Mean scores for BMI, Systolic BP, Diastolic BP, Resting heart rate, number of units of alcohol and number of cigarettes for Thurrock Active Sport for Life (ASfL: N=52) and Exercise on Referral (EoR: N=47) participant groups at three time points.

In Table 7 only one statistically significant difference is notable (at $p < .05$) with regard to the effects of group membership on *number of units of alcohol* consumed. In the EoR group at all three time points participant's *number of units of alcohol* consumed in the previous week is less for those in the ASfL intervention. Notably, ASfL participants start their programme at Time 1 reporting that they had consumed more *units of alcohol* in the previous week than did those in the Exercise on Referral group.

III.IV Comparing Barking & Dagenham plus Thurrock Active Sport for Life respondents *with* Barking & Dagenham Exercise on Referral participants

Rather than examining whether B&D ASfL produced better outcomes than Thurrock ASfL, which is not a question of theoretical relevance to this study, it was decided that the participants would be amalgamated into one ASfL group and differences over time on variables would be examined to establish the extent to which the Sports intervention impacted participants. Below are reported the results of such an analysis.

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Main effect, time	Main effect, group	Interaction group x time
Groups	ASfL	EOR	ASfL	EOR	ASfL	EOR	F	f	f
Vigorous exercise (mins)	2.8 (17.7)	30.6 (91.3)	54.2 (110.9)	109.0 (152.3)	95.4 (149.5)	116.4 (170)	28.6 (.001)	6.8 (.010)	1.07 (NS)
Moderate exercise (mins)	21.8 (59.5)	29.4 (73.4)	48.1 (103.4)	118.4 (179.3)	75.6 (168.9)	125.4 (159.5)	15.9 (.001)	10.7 (.001)	2.6 (NS)
Walking (mins)	128.5 (180.2)	166.5 (213.5)	168.2 (212.5)	225.1 (219.1)	191.3 (208.2)	243.1 (219.2)	5.07 (.007)	4.7 (.030)	.095 (NS)
Sport (mins)	2.8 (19.9)	7.9 (31.3)	64.4 (112.9)	37.6 (89.5)	83.4 (114.5)	77.3 (153.8)	26.3 (.001)	.84 (NS)	1.2 (NS)
All exercise (mins)	154.8 (189.4)	234.1 (312.1)	269.6 (295.2)	432.3 (401.3)	363.4 (351.2)	489.1 (441.7)	24.9 (.001)	10.5 (.001)	.78 (NS)
All activities (mins)	156.7 (190.5)	239.8 (322.1)	340.2 (319.8)	475.0 (460.3)	446.9 (384.4)	575.3 (561.1)	34.0 (.001)	7.8 (.006)	.27 (NS)
Physical health	23.6 (4.9)	24.9 (4.4)	25.2 (4.5)	26.1 (3.6)	26.0 (4.9)	26.1 (4.4)	10.9 (.001)	1.38 (NS)	1.1 (NS)
Emotional problems	11.5 (3.6)	12.4 (2.9)	12.6 (2.9)	13.9 (4.5)	12.9 (2.8)	13.0 (2.8)	10.8 (.001)	3.5 (.062)	2./1 (NS)
Well being	10.5 (6.5)	11.6 (6.7)	14.2 (7.1)	15.5 (6.4)	12.8 (2.8)	13.2 (2.7)	21.4 (.001)	1.5 (NS)	.37 (NS)
Loneliness	4.6 (2.7)	4.8 (1.7)	4.1 (1.6)	4.2 (1.6)	3.8 (1.4)	3.9 (1.7)	10.5 (.001)	.12 (NS)	.12 (NS)
Motivation	30.7 (5.6)	31.0 (3.9)	31.0 (3.7)	31.6 (3.9)	12.8 (7.0)	10.1 (2.6)	574.2 (.001)	1.3 (NS)	3.7 (.028)

Table 8: Mean scores for physical activity (previous week), health and psychological variables for Barking & Dagenham and Thurrock Active Sport for Life (ASfL; N=125) vs Exercise on Referral (EoR; N=55) participant groups at three time point.

In Table 8 for six activity measures (*vigorous & moderate exercise, walking, sport, all activity, and all exercise*), for *physical health*, and for three psychological variables (*wellbeing, loneliness and motivation*) there are statistically significant differences across the three time points, with notably duration of *sport, exercise* scores increasing relative to baseline (Time 1) over time, whether this be for ASfL or for EoR participants.

With regard to the effects of group membership on activity, participants in the ASfL group spent significantly more time engaging in sports activity than did those in the EoR group. Similarly, effects of group membership for *all exercise*, participants in EoR group spent more time engaged in vigorous and moderate exercise.

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Main effect, time f	Main effect, group f	Interaction Group x time F
	ASfL	EoR	ASfL	EoR	ASfL	EoR			
BMI	33.9 6.7	32.6 6.5	35.8 17.1	33.2 10.6	33.2 7.5	31.6 6.2	2.3 NS	1.5 NS	.24 NS
Systolic BP	124.8 16.6	124.8 19.0	126.5 17.8	122.5 15.4	124.0 16.3	123.0 15.8	.67 NS	.40 NS	1.5 NS
Diastolic BP	86.7 67.1	83.2 10.6	81.3 10.7	81.5 8.8	80.4 11.0	82.8 9.1	.48 NS	.07 NS	.27 NS
Resting heart rate	76.4 13.5	76.0 12.6	76.6 11.5	76.6 12.3	75.5 11.5	77.3 17.6	.041 NS	.066 NS	.37 NS
Number of units of Alcohol	2.4 6.7	1.5 4.5	1.8 5.1	.60 2.3	2.6 6.1	.71 2.2	.94 NS	4.04 .046	.40 ?
Number of cigarettes	2.8 11.6	.75 2.7	1.5 8.3	.35 1.2	.37 1.7	.48 1.9	1.6 NS	1.5 NS	1.07 NS

Table 9: Mean scores for BMI, systolic BP, diastolic BP, resting heart rate, number of units of alcohol and number of cigarettes for Barking & Dagenham plus Thurrock Active Sport for Life (ASfL; N=125) and Exercise on Referral (EoR; N=55) participant groups at four time points.

In Table 9 only one statistically significant difference is notable (at $p < .05$): specifically, with regard to the effects of group membership on cigarette consumption, with participants in the EoR group cutting down significantly more than did those in the ASfL group.

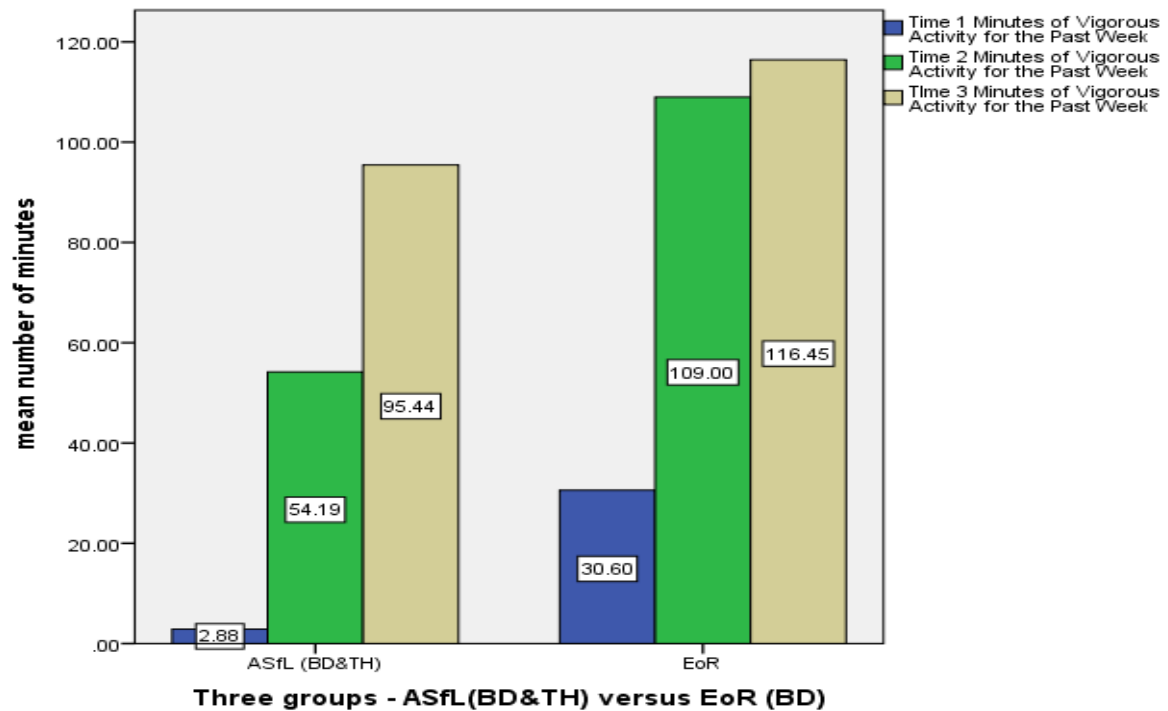


Figure 9: Bar chart of the average number of minutes in the previous week spent in vigorous activity at baseline, six weeks and twelve weeks for Barking & Dagenham (B&D) plus Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

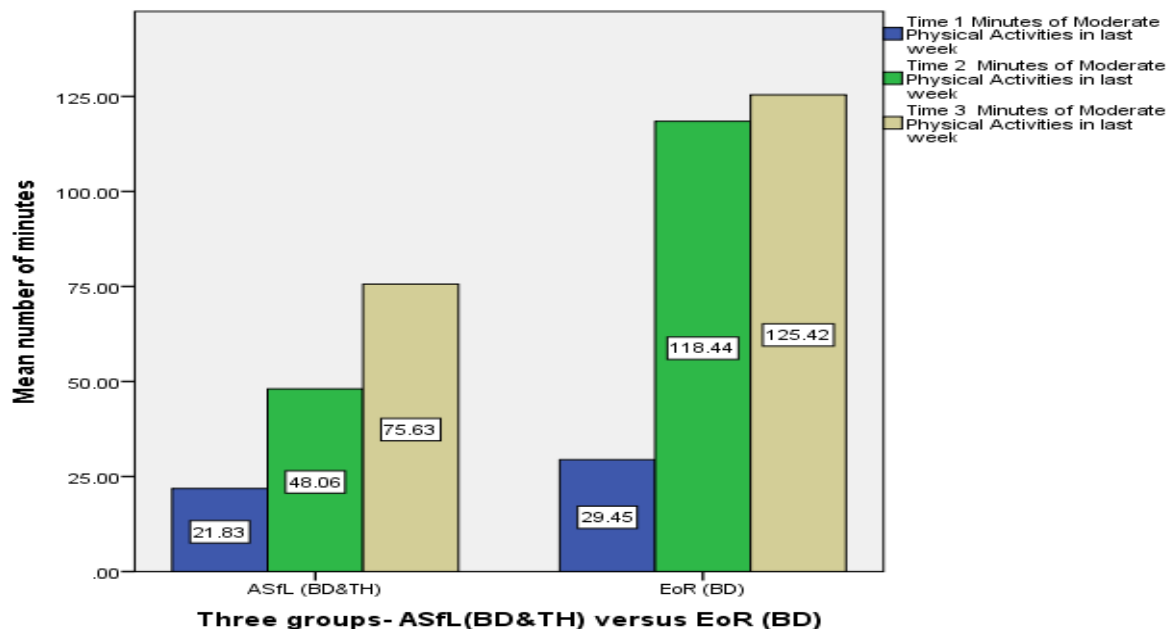


Figure 10: Bar chart of the average number of minutes in the previous week spent in moderate activity at baseline, six weeks and twelve weeks for Barking & Dagenham (B&D) plus Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

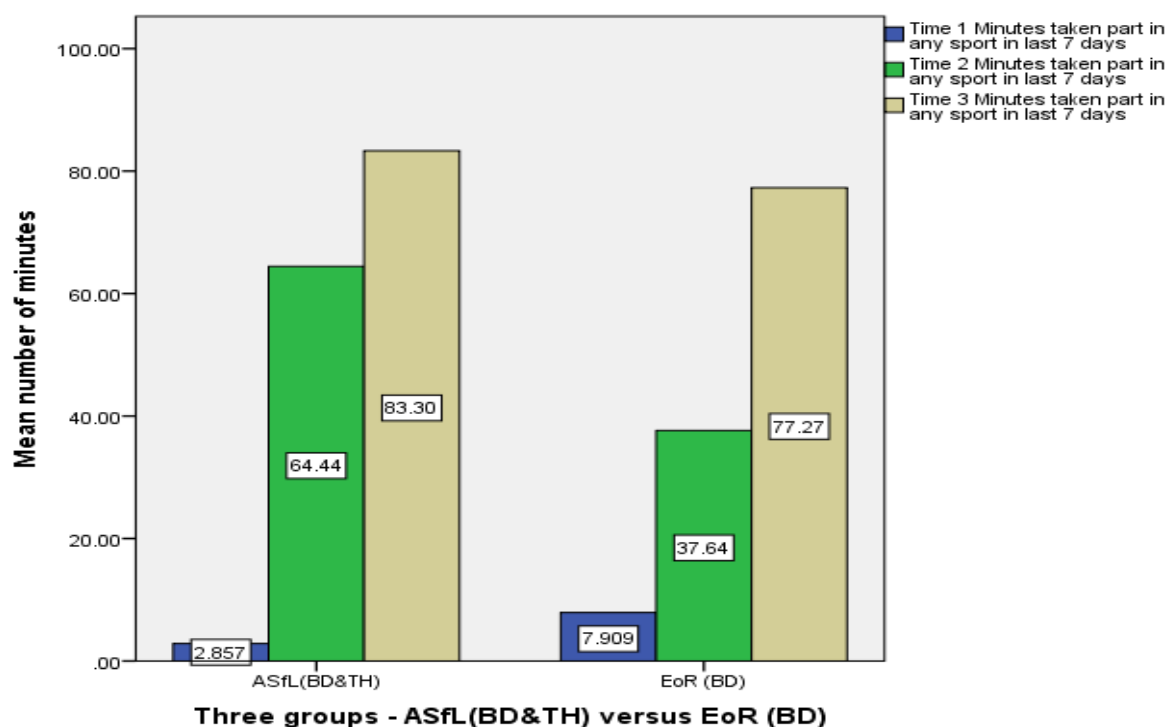


Figure 11: Bar chart of the average number of minutes in the previous week spent in sport at baseline, six weeks and twelve weeks Barking & Dagenham (B&D) plus Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

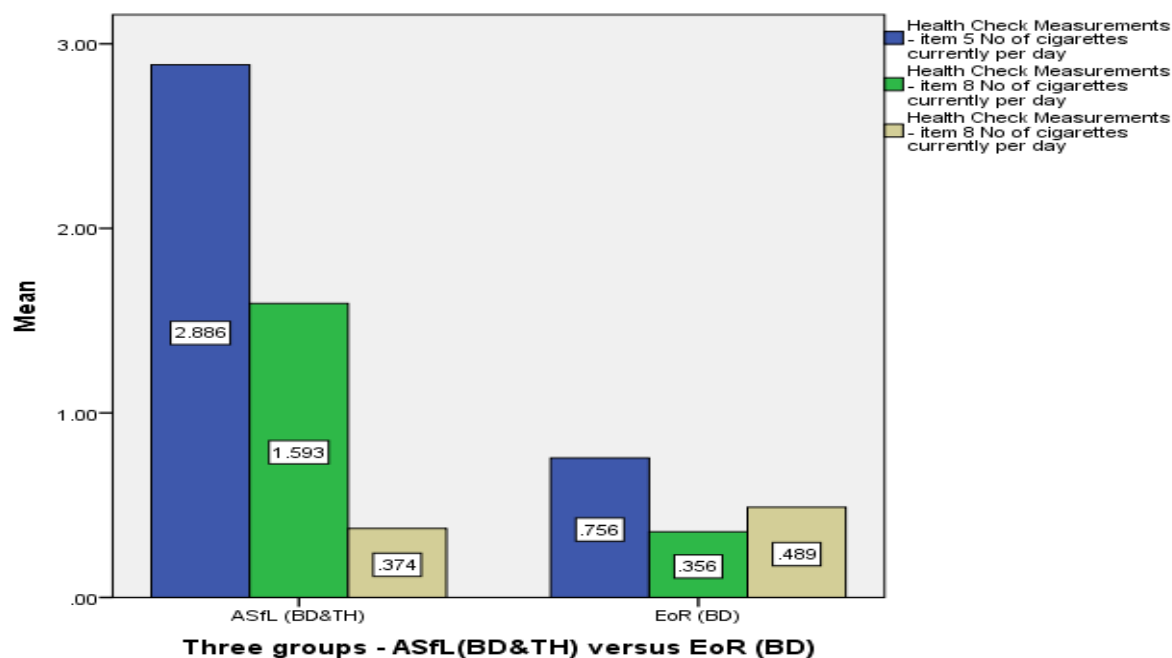


Figure 12: Bar chart of the average number of cigarettes smoked per day at baseline, six weeks and twelve weeks Barking & Dagenham (B&D) plus Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

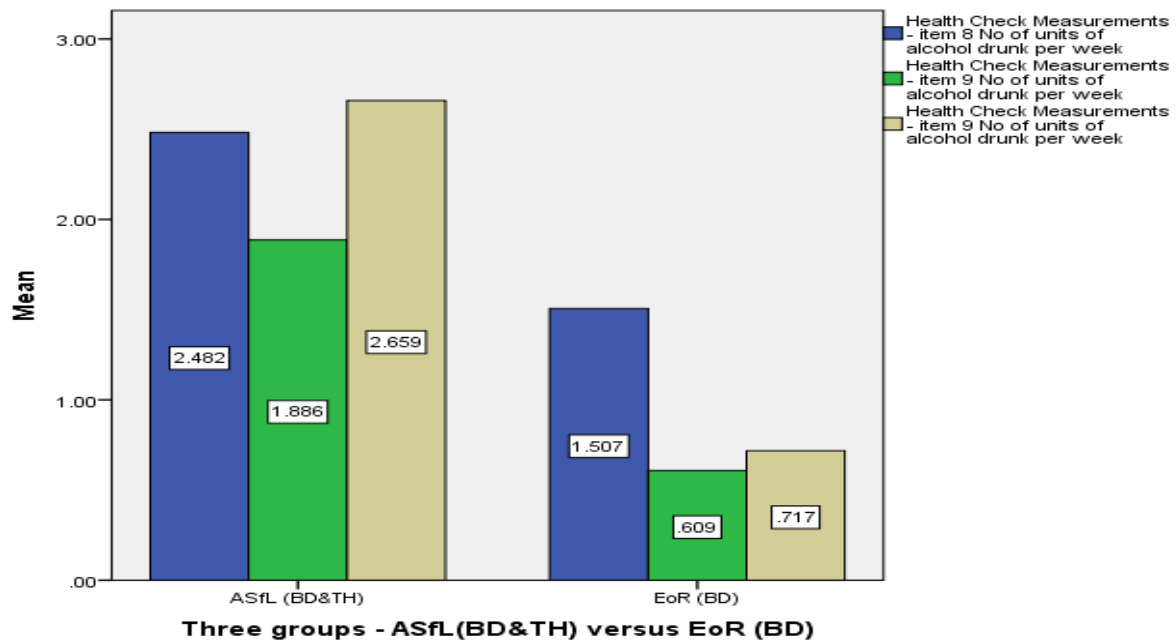


Figure 13: Bar chart of the average number of units of alcohol consumption per week at baseline, six weeks and twelve weeks Barking & Dagenham (B&D) plus Thurrock (TH) participants in the Active Sport for Life (AS4L) and Exercise on Referral (EOR) programmes

Looking at the bivariate correlations between variables measured at Time 1 and Time 3 in the Barking & Dagenham and Thurrock ASfL vs EoR samples, it was found that various predictor variables at Time 1 were related to 9 different Time 3 outcome measures. To establish which Time 1 variables independently of each other predicted scores on these Time 3 measures, two-stage regression analyses were undertaken, including the Time 1 equivalent of the dependent variable as an independent variable at the second stage. The results of these analyses in summary are as follows:

- For Time 3 walking activity, it was found that T1 moderate activity ($B=.29$, $t=2.3$, $p=.021$), T1 number of cigarettes per day ($B=.18$, $t=2.6$, $p=.010$) and T1 diastolic BP ($B=.28$, $t=4.1$, $p=.001$) were independent predictors, accounting collectively for 17% of the variance ($r^2=.17$)
- For Time 3 PHQ physical health, it was found that T1 motivation ($B=.18$, $t=2.6$, $p=.011$) and T1 PHQ physical health ($B=.34$, $t=3.9$, $p=.001$) were independent predictors, accounting collectively for 18% of the variance ($r^2=.18$)
- For Time 3 PHQ emotional problems, it was found that T1 motivation ($B=.19$, $t=2.9$, $p=.004$), T1 numbers of units of alcohol per week ($B=-.19$, $t=-2.9$, $p=.004$) and T1 PHQ emotional problems ($B=.39$, $t=3.9$, $p=.001$) were independent predictors, accounting collectively for 25% of the variance ($r^2=.25$)
- For Time 3 WHO Well-Being, it was found that T1 PHQ physical health ($B=.34$, $t=3.9$, $p=.001$), T1 motivation ($B=.19$, $t=2.9$, $p=.004$) and T1 number of units of alcohol ($B=-.19$, $t=-2.9$, $p=.004$) were independent predictors, accounting collectively for 25% of the variance ($r^2=.25$)

- For scores on the Time 3 Hughes measure of loneliness, it was found that T1 PHQ emotional problems ($B=-.23$, $t=-2.3$, $p=.022$) and T1 numbers of units of alcohol ($B=.15$, $t=1.9$, $p=.048$) were independent predictors, accounting collectively for 15% of the variance ($r^2=.15$)
- For Time 3 systolic blood pressure (BP), it was found that Time 1 systolic BP ($B=.63$, $t=9.8$, $p=.001$) was an independent predictor, accounting collectively for 40% of the variance ($r^2=.40$)
- For Time 3 diastolic blood pressure (BP), it was found that T1 body mass index (BMI) ($B=.16$, $t=2.5$, $p=.013$), T1 systolic BP ($B=.42$, $t=6.4$, $p=.001$) and T1 motivation ($B=.19$, $t=3.1$, $p=.003$) were independent predictors, accounting collectively for 27% of the variance ($r^2=.27$)
- For Time 3 body mass index, it was found that Time 1 BMI ($B=.82$, $t=18.3$, $p=.001$) was the sole independent predictor, accounting collectively for 70% of the variance ($r^2=.70$)
- For Time 3 minutes of activity per week, it was found that the T1 grouping variable ($B=.23$, $t=3.0$, $p=.003$), T1 systolic BP ($B=.15$, $t=2.1$, $p=.038$) and T1 number of cigarettes per day ($B=.26$, $t=3.6$, $p=.001$) were independent predictors, accounting collectively for 16% of the variance ($r^2=.16$)

III.V Comparing Thurrock Active Sport for Life respondents with Thurrock Gym&Swim participants

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Main ef- fect, time	Main ef- fect, group	Interaction Group x time
Groups	ASfL	G/S	ASfL	G/S	ASfL	G/S	f	f	f
Vigorous exercise (mins)	1.50 (7.69)	3.00 (13.24)	44.52 (72.58)	82.37 (108.78)	100.66 (159.10)	71.77 (110.36)	20.55 (.001)	.074 (NS)	3.04 (NS)
Moderate exercise (mins)	27.35 (64.82)	21.15 (45.72)	55.28 (115.10)	47.90 (68.79)	46.69 (78.91)	36.75 (85.72)	2.76 (NS)	.606 (NS)	.013 (NS)
Walking (mins)	131.16 (158.75)	184.88 (202.61)	186.37 (183.98)	206.00 (195.40)	181.68 (187.88)	147.00 (152.01)	1.74 (NS)	3.10 (NS)	.152 (NS)
Sport (mins)	3.39 (24.72)	3.00 (18.98)	106.41 (145.49)	119.62 (78.91)	87.46 (92.45)	106.02 (130.90)	39.46 (.001)	.665 (NS)	.271 (NS)
All exercise (mins)	161.16 (171.05)	209.02 (198.73)	280.09 (208.03)	336.27 (218.70)	331.27 (268.78)	253.02 (188.54)	10.64 (.001)	.083 (NS)	3.37 (.040)
All activities (mins)	164.68 (172.67)	252.02 (201.49)	401.27 (261.31)	455.90 (260.02)	419.80 (286.10)	359.05 (289.92)	27.89 (.001)	.162 (NS)	1.75 (NS)
Physical health	26.18 (3.16)	27.20 (7.61)	27.04 (3.10)	27.10 (4.40)	27.02 (3.96)	26.22 (4.33)	.380 (NS)	.017 (NS)	1.35 (NS)
Emotional problems	12.19 (2.95)	12.67 (2.76)	12.78 (3.10)	13.42 (2.13)	13.02 (2.99)	13.42 (2.13)	4.84 (.010)	1.11 (NS)	.086 (NS)
Well being	11.44 (6.09)	13.62 (7.56)	13.71 (6.31)	16.32 (5.91)	12.91 (3.05)	13.42 (2.13)	8.24 (.001)	3.95 (.050)	1.51 (NS)
Loneliness	4.63 (3.53)	4.95 (5.56)	4.16 (1.72)	4.05 (1.44)	3.91 (1.56)	3.91 (1.56)	3.36 (NS)	.009 (NS)	.222 (NS)
Motivation	29.80 (3.53)	30.12 (2.79)	31.00 (2.99)	37.37 (13.03)	17.30 (12.81)	17.30 (12.81)	25.88 (.001)	.339 (NS)	1.612 (NS)

Table 10: Mean scores for physical activity (previous week), health and psychological variables for Thurrock Active Sport for Life (ASfL; N=52) and Thurrock (Gym/swim; N=40) participant groups at three time points.

Notable features of the data and analysis shown in Table 10 include that for four activity measures (*vigorous, sport, all exercise* and *all activity*), for physical health (*emotional problems*), and for two psychological variables (*wellbeing* and *motivation*) there are statistically significant differences across the three time points, with notably duration of *sport, exercise* and *well-being* scores increasing relative to baseline (Time 1) over time, whether this be for ASfL or for gym-swim participants.

With regard to the effects of group membership on *well-being*, looking at the scores here it is apparent that self-reported well-being appears to improve slightly more at Time 2 in the gym-swim group, than for those in the ASfL group, though it should also be noted that the ASfL's well-being score starts at a lower point at Time 1.

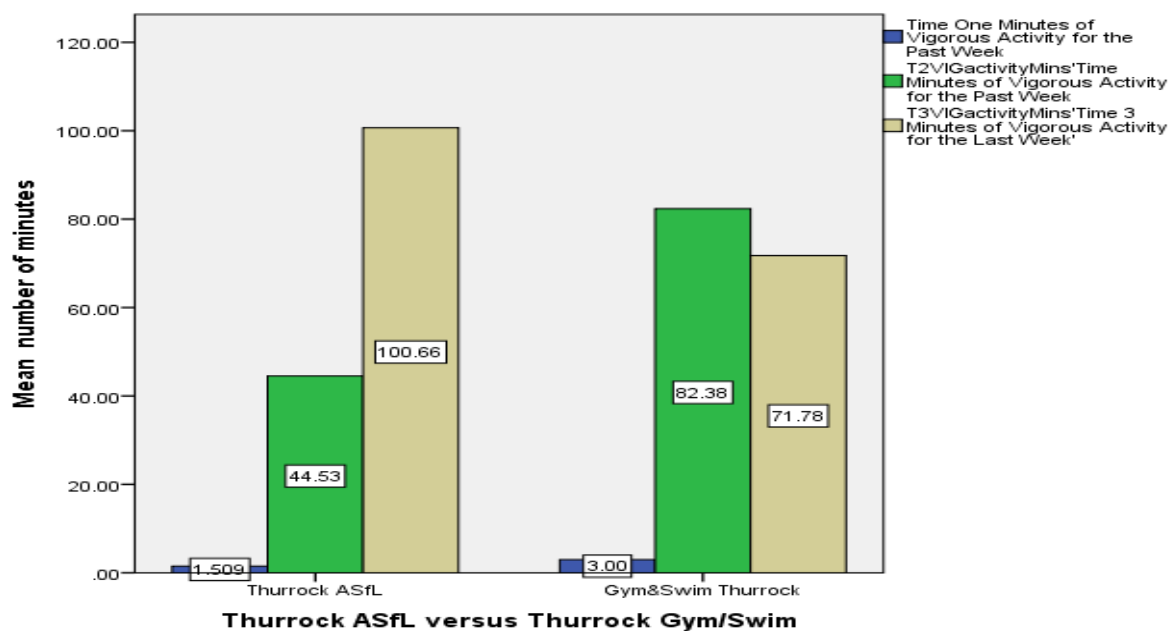


Figure 14: Bar chart of the average number of minutes in the previous week spent in vigorous activity at baseline, six weeks and twelve weeks for Thurrock (TH) participants in the Active Sport for Life (AS4L) and Thurrock (TH) participants in the gym & swim.

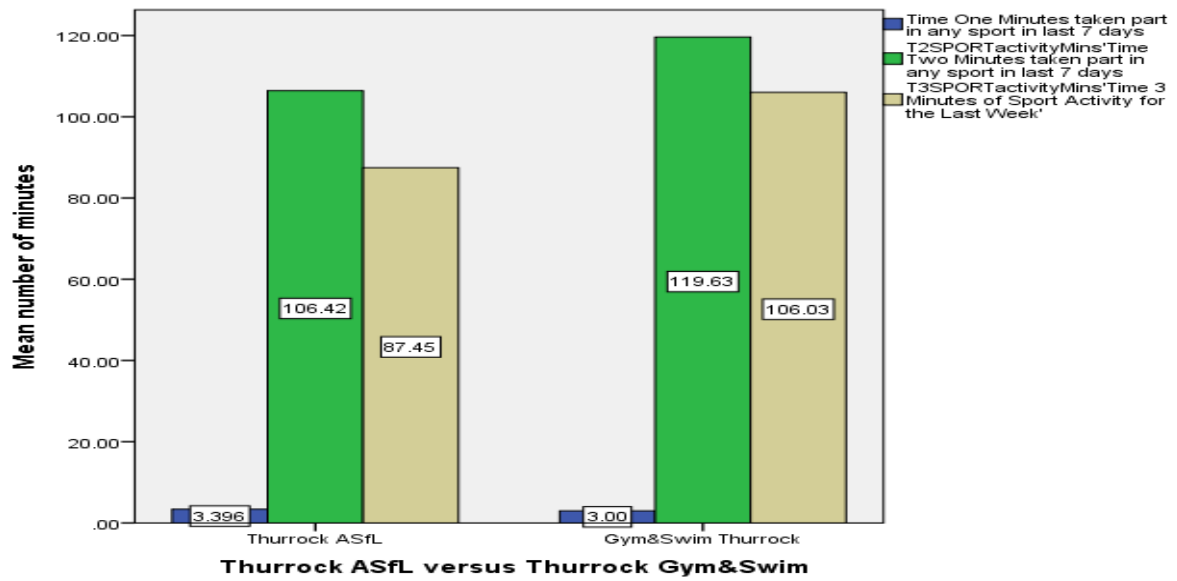


Figure 15: Bar chart of the average number of minutes in the previous week spent in sport at baseline, six weeks and twelve weeks for Thurrock (TH) participants in the Active Sport for Life (AS4L) and Thurrock gym & swim programmes

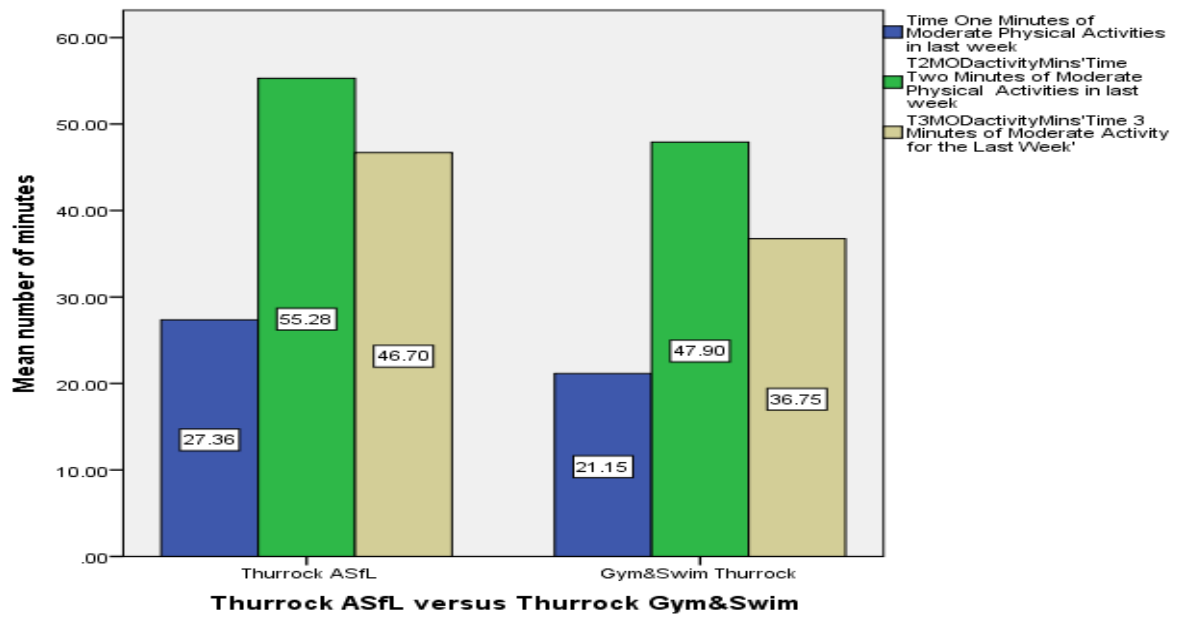


Figure 16: Bar chart of the average number of minutes in the previous week spent in moderate activity at baseline, six weeks and twelve weeks for Thurrock (TH) participants in the Active Sport for Life (AS4L) and Thurrock gym & swim programmes

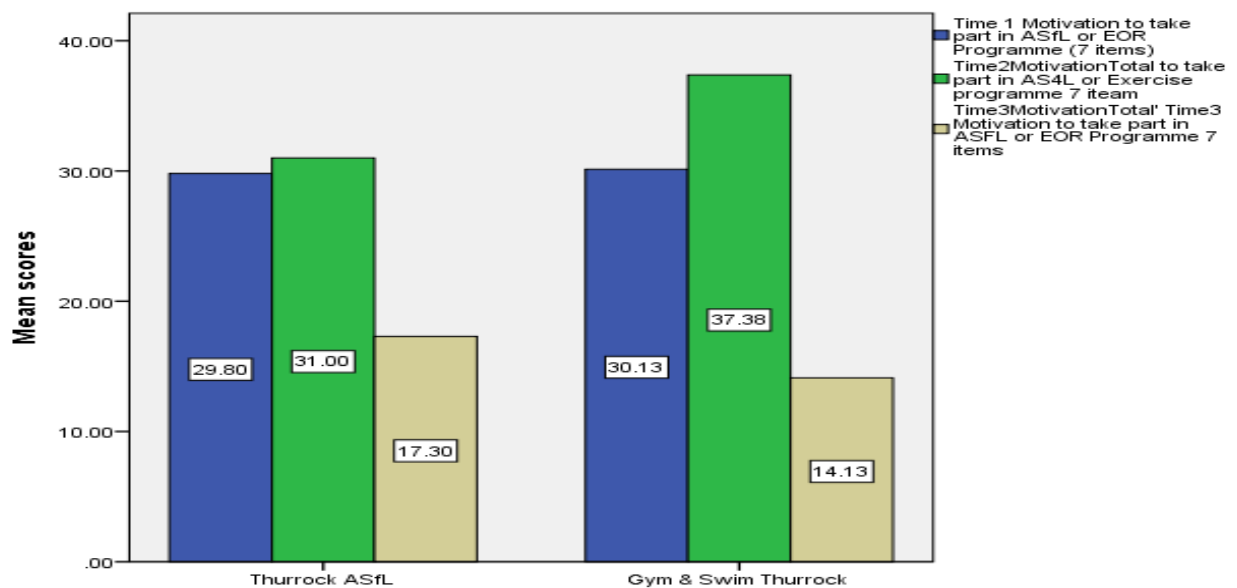


Figure 17: Bar chart of the mean scores in motivation, taking part in Active Sport for Life (ASfL) or gym & swim programmes (EoR) at baseline, six weeks and twelve weeks for Thurrock (TH) participants in the Active Sport for Life (AS4L) and Thurrock gym & swim.

Looking at the correlations between variables measured at Time 1 and Time 3 in the Thurrock ASfL & gym/swim Thurrock samples, it was found that various predictor variables at Time 1 were related to seven different Time 3 outcome scores. To establish which Time 1 variables independently of each other predicted scores on these Time 3 measures, regression analyses were undertaken. The results of these analyses in summary are as follows:

- For Time 3 points PHQ emotional problems, it was found that vigorous activity (minutes last week) ($B = -.36$, $t = -4.2$, $p = .001$), and PHQ emotional problems (Time 1) ($B = .43$, $t = 5.2$, $p = .001$) were independent predictors, accounting collectively for 34% of the variance ($r^2 = .34$)
- For Time 3 points well-being, it was found that vigorous activity (minutes last week), ($B = -.39$, $t = -4.6$, $p = .001$), and PHQ emotional problems ($B = .26$, $t = 2.2$, $p = .029$) were independent predictors, accounting collectively for 37% of the variance ($r^2 = .37$)
- For Time 3 points loneliness, it was found that PARQ illness symptoms ($B = .20$, $t = 2.1$, $p = .047$), was an independent predictors, accounting collectively for 18% of the variance ($r^2 = .18$)
- For Time 3 points Body Mass Index, it was found that age in years ($B = -.11$, $t = -1.9$, $p = .054$), number of cigarettes per day ($B = .16$, $t = 2.5$, $p = .017$) and Body Mass Index (Time 1), ($B = .81$, $t = 13.1$, $p = .001$) were independent predictors, accounting collectively for 76% of the variance ($r^2 = .76$)

- For Time 3 points, number of units of alcohol, it was found that T1 grouping variable ($B = -.19$, $t = -1.9$, $p = .051$), and PARQ ($B = -.27$, $t = -2.7$, $p = .006$) were independent predictors, accounting collectively for 19% of the variance ($r^2 = .19$)
- For Time 3 points systolic blood pressure, it was found that Body Mass Index ($B = .20$, $t = 2.1$, $p = .032$), sex ($B = -.18$, $t = -1.9$, $p = .056$) and systolic BP (Time 1), ($B = .36$, $t = 3.4$, $p = .001$) were independent predictors, accounting collectively for 31% of the variance ($r^2 = .31$)
- For Time 3 points diastolic blood pressure, it was found that motivation ($B = .19$, $t = 2.0$, $p = .044$), was an independent predictors, accounting collectively for 27% of the variance ($r^2 = .27$)

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Main effect, time f	Main effect, group f	Interaction Group x time F
	ASfL	EoR	ASfL	EoR	ASfL	EoR			
BMI	33.4 6.9	32.9 6.3	34.7 11.3	33.4 6.1	33.3 6.9	32.9 6.3	1.01 NS	.24 NS	.28 NS
Systolic BP	130.5 15.7	133.3 17.5	126.8 25.4	134.8 17.3	125.6 21.0	131.9 21.4	1.03 NS	2.9 NS	.69 NS
Diastolic BP	82.07 10.4	81.4 9.0	81.1 10.6	81.0 8.5	78.8 10.8	79.5 9.3	3.38 .039	.011 NS	.27 NS
Resting heart rate	75.4 13.3	75.6 19.1	75.5 11.5	75.8 12.26	73.8 12.2	80.6 21.51	.074 NS	.84 NS	2.7 NS
Number of units of Alcohol	4.90 9.4	4.4 9.3	2.8 6.5	1.5 3.6	4.0 7.8	.67 1.81	4.7 .022	2.46 NS	1.45 NS
Number of cigarettes	1.73 10.2	12.9 32.7	.31 1.6	1.3 4.6	.24 1.5	1.0 4.4	7.5 .007	6.4 .013	4.5 .035

Table 11: Mean scores for BMI, Systolic BP, Diastolic BP, Resting heart rate, number of units of alcohol and number of cigarettes for Thurrock Active Sport for Life (ASfL; N=52) and Thurrock (Gym/swim; N=39) participant groups at three time points.

In Table 11, notably for three health check measures (*diastolic blood pressure, number of units of alcohol, number of cigarettes*), there are statistically significant differences across the three time points. Both groups showed improvement in *diastolic blood pressure, reduced units of alcohol* consumption and reducing number of *cigarettes* smoked.

With regard to the effects of group membership on *cigarettes* smoked, participants in the EoR group reduced significantly more than did those in the ASfL group. A significant interaction between group membership and progression over time of the *number of cigarettes* consumed is observed, with EoR participants in particular showing the greatest effect and reduction from baseline assessment.

III.VI Comparing Barking & Dagenham Active Sport for Life respondents with Thurrock Active Sport for Life participants.

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Main ef- fect, time	Main ef- fect, group	Interaction Group x time
Groups	ASfL B&D	ASfL TH	ASfL B&D	ASfL TH	ASfL B&D	ASfL TH	f	f	F
Vigorous exercise (mins)	1.50 (7.69)	3.89 (22.49)	44.52 (72.58)	161.31 (132.41)	100.66 (159.10)	91.59 (141.93)	27.42 (.001)	.06 (NS)	.52 (NS)
Moderate exercise (mins)	27.35 (64.82)	17.80 (55.60)	55.28 (115.10)	42.80 (94.58)	46.69 (78.91)	96.65 (205.81)	5.23 (.011)	.57 (NS)	2.69 (NS)
Walking (mins)	131.16 (158.75)	126.78 (194.92)	186.37 (183.98)	155.28 (231.08)	181.68 (187.88)	198.19 (222.64)	3.63 (.029)	.062 (NS)	.53 (NS)
Sport (mins)	3.39 (24.72)	2.47 (15.61)	106.41 (145.49)	33.98 (67.97)	87.46 (92.45)	86.29 (128.74)	31.26 (.001)	6.37 (.013)	6.55 (.002)
All exercise (mins)	161.16 (171.05)	150.25 (202.77)	280.09 (208.03)	262.09 (345.90)	331.27 (268.78)	386.48 (400.72)	18.56 (.001)	.06 (NS)	.73 (NS)
All activities (mins)	164.68 (172.67)	151.09 (203.39)	401.27 (261.31)	296.18 (351.07)	419.80 (286.10)	466.49 (442.65)	31.37 (.001)	.41 (NS)	2.17 (NS)
Physical health	26.18 (3.16)	21.45 (5.23)	27.04 (3.10)	23.73 (4.98)	27.02 (3.96)	25.22 (5.58)	12.50 (.001)	23.57 (.001)	4.83 (.013)
Emotional problems	12.19 (2.95)	11.07 (3.11)	12.78 (3.10)	12.48 (2.92)	13.02 (2.99)	12.87 (2.75)	10.39 (.001)	.87 (NS)	1.7 (NS)
Well being	11.44 (6.09)	9.82 (6.84)	13.71 (6.31)	14.67 (7.77)	12.91 (3.05)	12.87 (2.75)	14.89 (.001)	.09 (NS)	1.95 (NS)
Loneliness	4.63 (3.53)	4.66 (1.84)	4.16 (1.72)	4.19 (1.55)	3.91 (1.56)	3.89 (1.19)	6.21 (.001)	.005 (NS)	.009 (NS)
Motivation	29.80 (3.53)	30.92 (6.06)	31.00 (2.94)	31.07 (3.95)	17.30 (12.81)	11.75 (4.22)	87.29 (.001)	1.82 (NS)	3.22 (.051)

Table 12: Mean scores for physical activity (previous week), health and psychological variables for Barking & Dagenham (ASfL; N=73) and Thurrock (ASfL; N=53) participant groups at three time points

Notable features in Table 12 include the observations that for six activity measures (*vigorous, moderate exercise, walking, sport, all exercise, all activity*), for *physical health*, and for three psychological variables (*wellbeing, loneliness* and *motivation*) there are statistically significant differences across the three time points, with notably duration of *sport, exercise* and *well-being* scores increasing relative to baseline (Time 1) over time, whether this be for B&D ASfL or for ASfL Thurrock participants.

With regard to the effects of group membership on *activity*, participants in the Barking &Dagenham ASfL group spent significantly more time engaged in *sports activity* than did those in the Thurrock ASfL group.

With regard to the effects of group membership on *physical health*, looking at the scores here, it is apparent that self-reported *physical health* appears to improve slightly over time in the Thurrock ASfL group, but remains similar over time for Barking &Dagenham ASfL participants.

In terms of the interaction between group membership and progression of *activity* over time, participants in the Barking &Dagenham ASfL group by Time 2 are reporting spending significantly more time in such *activity* than those in the Thurrock ASfL group.

	Time 1		Time 2 (6 weeks)		Time 3 (12 weeks)		Main effect, time f	Main effect, group f	Interaction Group x time F
	ASfL B&D	ASfL TH	ASfL B&D	ASfL TH	ASfL B&D	ASfL TH			
BMI	34.2 6.7	33.4 6.9	33.8 6.8	34.7 11.3	33.5 6.9	33.3 6.9	1.3 NS	.003 NS	1.5 NS
Systolic BP	120.6 15.7	130.8 15.9	124 15.8	128.8 19.8	123.2 12.2	125.6 21.0	1.5 NS	4.7 .033	4.9 .008
Diastolic BP	80.1 10.3	82.0 10.4	81.1 10.0	81.7 10.6	81.9 11.1	78.8 10.9	.58 NS	.010 NS	3.6 .028
Resting heart rate	77.1 13.8	75.4 13.3	77.4 11.5	75.5 11.53	76.7 11.0	73.8 12.1	.56 NS	1.4 NS	.14 NS
Number of units of Alcohol	.71 2.7	4.9 9.4	1.1 3.6	2.8 6.5	1.6 4.4	4.0 7.8	1.10 NS	12.5 .001	2.11 NS
Number of cigarettes	3.7 12.4	1.7 10.2	2.5 10.7	.30 1.7	.47 1.9	.23 1.4	3.2 .46	1.9 NS	.67 NS

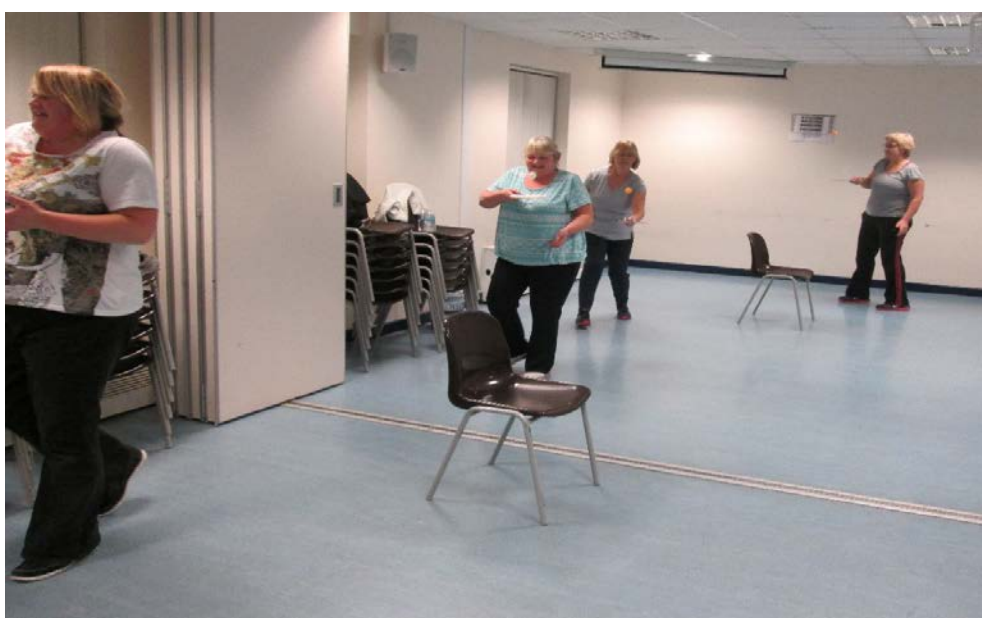
Table 13: Mean scores for BMI, Systolic BP, Diastolic BP, Resting heart rate, number of units of alcohol and number of cigarettes for Barking & Dagenham (ASfL; N=72) and Thurrock (ASfL; N=52) participant groups at three time points.

Notable features of Table 13 include the observations that for one health check variable (*number of cigarettes*), there are statistically significant differences (in the direction of a reduction) across the three time points, whether this be for Thurrock ASfL or for Barking & Dagenham ASfL participants.

With regard to the effects of group membership on health check measures, participants in the Thurrock ASfL group showed significantly reduced systolic and diastolic blood pressure over the three time points whilst those in the ASfL group did not.



Boxing session in Thurrock



Bat & ball skills session in Thurrock

IV Discussion

IV.I Summary of the main findings

IV.I.I. Comparing Barking & Dagenham *Active Sport for Life (ASfL)* with Barking & Dagenham *Exercise on Referral (EoR)*

EoR and ASfL programmes were observed to produce beneficial effects for participants over time for all activity measures (for vigorous & moderate exercise, walking, sport, all activity, and all exercise), for physical health, and for three psychological variables, namely wellbeing, loneliness and motivation (see Table 3, p. 24). As to be expected, participants in the ASfL group spent significantly more time engaged in sports activity than did those in the EoR group. Participants in the EoR group spent significantly more time engaged in walking and 'all exercise' than did those in the ASfL group.

EoR group participant's BMI is less on average from baseline Time 1 through Time 6 (twelve months) than for those in the ASfL group (see Table 4, p. 29). So EoR participants start their programme with a healthier weight-to-height ratio than those referred to the ASfL programme. For systolic blood pressure a significant interaction of group and time is noted, though there is no main effect of either: specifically, average systolic blood pressure tends to decrease over the twelve month measurement period in the EoR group but not noticeably in the ASfL.

In summary, both EoR and ASfL activity programmes produce beneficial effects for participants over time. Neither form of activity, however, appears to be consistently better than the other.

IV.I.II. Comparing Thurrock *Active Sport for Life* with Barking & Dagenham *Exercise on Referral*

Barking & Dagenham EoR and Thurrock ASfL programmes produce beneficial effects for participants over time for all activity measures (vigorous & moderate exercise, walking, sport, all activity, and all exercise), for physical health, and for three psychological variables, wellbeing, loneliness and motivation (see Table 6, p. 31). Participants in the ASfL group spent significantly more time engaged in sports activity than did those in the EoR group, as to be expected, while participants in the EoR group spent more time engaged in exercise such as vigorous and moderate exercise.

Membership of the B&D Exercise on Referral group conferred better outcomes at Time 3 than did membership of the Thurrock Active Sport for Life group, with both groups however having improved over time. However, a qualification of this observed difference is that the EoR participants on average started at Time 1 with better health scores than their ASfL counterparts.

In the EoR group number of units of alcohol consumed was less than those in the ASfL group (see Table 7, p. 36). However, ASfL participants start their programme at Time 1 reporting that they had consumed more units of alcohol in the previous week than did those in the Exercise on Referral group.

IV.I.III Comparing Barking & Dagenham+Thurrock *Active Sport for Life* with Barking & Dagenham *Exercise on Referral*

Barking & Dagenham and Thurrock ASfL and EoR programmes were found to produce beneficial effects for participants over time for six activity measures (specifically, vigorous & moderate exercise, walking, sport, all activity, and all exercise), for physical health, and for three psychological variables wellbeing, loneliness and motivation (see Table 8, p. 37). For these measures there were statistically significant differences across the three time points, with notably duration of sport, exercise scores increasing relative to baseline (Time 1) over time, irrespective of whether this was for ASfL or EoR participants.

As to be expected, participants in the ASfL group spent significantly more time engaging in sports activity than did those in the EoR group, while the latter spent more time engaged in vigorous and moderate exercise.

One notable statistical difference between the ASfL and EoR groups, (see Table 9, p. 38) however, was that for cigarette consumption participants in the EoR group were seen to cut down more than ASfL participants across three time points (from baseline to six weeks and three months).

IV.I.IV Comparing Thurrock *Active Sport for Life* with Thurrock *Gym&Swim (Exercise+Sport)*

Thurrock ASfL and Thurrock Gym&Swim programmes were both seen to produce beneficial effects for participants over time for four activity measures (vigorous, sport, all exercise and all activity), for physical health (emotional problems), and for two psychological variables (wellbeing and motivation), there being statistically significant differences across the three time points (see Table 10, p. 43). Notably duration of sport, exercise and well-being scores increased relative to baseline (Time 1) over time, whether this be for ASfL or for gym-swim participants.

Looking at self-reported well-being, it is apparent that scores on this measure improve slightly more in the gym-swim group, than for those in the ASfL group, though it should also be noted that the ASfL's well-being scores start on average at a lower point at Time 1.

Notably, for three health check measures (diastolic blood pressure, number of units of alcohol, number of cigarettes), there are statistically significant differences across the three time points. Both groups showed improvement in diastolic blood pressure, reduced units of alcohol consumption and reduced number of cigarettes smoked (see Table 11, p. 48). However, participants in the EoR group reduced their smoking significantly more than did those in the ASfL group.

IV.I.V Comparing Barking & Dagenham *Active Sport for Life* with Thurrock *Active Sport for Life*

Barking & Dagenham ASfL and Thurrock ASfL programmes both were observed to produce beneficial effects for participants over time for all activity measures (vigorous & moderate exercise, walking, sport, all activity, and all exercise), for physical health, and for three psychological variables wellbeing, loneliness and motivation (see Table 12, p. 49). Notably duration of sport, exercise and well-being scores were seen to increase relative to baseline

over time for both Barking & Dagenham and Thurrock participants. Cigarette usage was seen to reduce amongst both sets of participants.

Two qualifications of this general pattern were notable: firstly, that physical health appears to improve slightly more over time in the Thurrock ASfL group than within the Barking & Dagenham group; and secondly, participants in the Thurrock ASfL group showed significantly reduced systolic and diastolic blood pressure over the three time points whilst for those in the ASfL group these indices remained the same (see Table 13, p. 51).

So, in summary what has been found that both EoR and Sport activity programmes (ASfL and Swim&Gym) produce beneficial effects for participants over time. No one form of activity appears to be consistently better than the other.

IV.II How our findings relate to those in other studies

Findings reported in this ASfL evaluation study in relation to the superior efficacy of group activities, whether sport or exercise based, are consistent with those of Frederick & Ryan (1993) who examined the motivational factors that influence adult engagement in physical activity. They found that people who take part in sport are more motivated by interest, enjoyment and a desire to be competent in what they are doing than those taking part in fitness and exercise activity who are more concerned about body related and appearance considerations. They also found that such motivations are influenced too by whether the participant is male or female. The findings from this often cited study underscore the importance of considering both types of physical activity and the motives that energize participation.

In this ASfL evaluation we did not find compelling evidence to conclude that sports activities may have superior outcomes associated with them than exercise-based ones. Indeed, it was apparent that both forms of activity confer benefits over time upon participants. However, we cannot discount the possibility that the possibly greater efficacy of sports activity in this study may have been partially obscured by the fact that the EoR participants did not have to pay for their involvement over the entire twelve months, while the ASfL participants in Thurrock were obliged to pay a small attendance fee (£2.00 per session) after the initial three months, with those ASfL participants in Barking & Dagenham having free sessions for the first nine months. However, the focal comparison of B&D ASfL with B&D EoR at 6 months follow-up (see Table 2, page 22) wherein members of both groups were not having to pay for participation and so were equivalent in this respect, showed no superior effect on any outcomes measures of one form of activity over the other.

That ASfL activities did not appear to be more beneficial than EoR activities is not inconsistent with other studies wherein individual exercise based activity is seen to produce desirable outcomes. For example, Karbandi, Gorji, Mazloum, Norian & Aghei (2015) examined the effectiveness of group versus individual yoga sessions on fatigue in people with multiple sclerosis (MS), with the fatigue level of patients being evaluated in both groups at three time points: before, three and six weeks after the intervention. Improvements in fatigue were noted in those allocated to the individual sessions. Other

studies however, have found in favour of activity undertaken in groups (for example, Burke, Carron, Eys, Ntoumanis & Estabrooks, 2006). Thus, it can be seen that studies are not in agreement the relative efficacy of individual versus group activity, however what they are clear about is that both forms of activity have tangible positive effects on mental health and well-being.

IV.III Limitations of our study

- ***Data analytic challenges***

In our comparison of ASfL and EoR participants, complete data had been obtained at six time points over the twelve month follow-up period from a total of 67 ASfL respondents and 57 EoR participants. At the beginning of the study recruitment of participants was in excess of 300 at Time 1 in both groups. However, follow-up and data collection over the ensuing five time-points did not keep pace with this initial recruitment, despite calls for improved data capture. Undoubtedly, this has left the evaluation component of the project statistically underpowered. To illustrate the point, in a similarly designed study by Strid, Andersson, Forsell, Ojehagen & Lundh's (2016), which compared the effects of inter-net-based CBT with a physical exercise intervention and a treatment as usual condition, responses were obtained from more than 278 participants in each group through to twelve month follow-up. Thus, Strid et al's (2016) study has four to five times more participants than here. The sophistication of the analyses that can be conducted on the ASfL/EoR data set have been significantly constrained by the relatively low respondent numbers, with for example, multilevel modelling not being possible (as after, for example, Terlecki, Buckner, Larimer & Copeland, 2015). However, every attempt has been made to maximise the utility of the data by thoroughly examining it using a variety of statistical techniques which include both analysis of variance and regression. We acknowledge however, that at three-month follow-up ASfL respondents numbered 154 (across LBBD & Thurrock), with EoR respondents number 55. Nevertheless, the point remains that recruitment of sufficient numbers of participants across the successive time points of the study did not attain the scale that was anticipated at the start of the project given the scale of initial recruitment onto the activity programmes, and even when factoring in expected attrition rates over the ensuing follow-up period.

Another data analytic challenge the project posed was that the participants in the ASfL and the EoR groups were not equivalent at its start: that is to say, they were not matched on a variety of variable but differed for example with the ASfL group participants being largely inactive initially, whilst EoR respondents began the programme with ongoing levels of activity. Also, ASfL respondents started with more emotional and physical problems than EoR participants, whilst ASfL members from the beginning had more psychological difficulties than EoR members. We also saw that ASfL respondents initially tended to consume more alcohol and cigarettes than EoR participants. Whilst it would be desirable to have groups that were equivalent on these factors at the beginning of the evaluation, it was possible to control for their effects statistically. However, one difference between the two groups remained problematic, and that was in terms of groups members were financially incentivised or not to continue with their programme of activity over the twelve months. So, at the beginning of the study EoR participants in Barking & Dagenham were told that if they attended sessions regularly during the first three months,

their free gym membership would be extended for a further nine months. For ASfL participants in both Barking & Dagenham, and Thurrock they were told at the beginning of the study that they would receive free membership for the first three months, but thereafter they would have to pay £2.00 per session for the remaining nine months. However, in an effort to make the groups more equivalent, in the ASfL group in Barking & Dagenham after three months a further six months was offered free, no charges being collected in that period. For Thurrock ASfL participants, however, after three months they had to pay £2 per session. Thereby it is evident that expectations and patterns of financial incentive were not uniform across sub-groups or across time. Statistically, it was difficult to control for the effects of this source of variation in outcome measure scores. Clearly, as was advised early on, such variation should not have occurred.

- ***Process & methodological issues***

The study used a repeated measures design in which a detailed questionnaire is administered to the same respondents at regular intervals over a twelve month period by personnel whose principle function it was to deliver sport or exercise activity sessions. The administration of psychometric instruments is a skilled task. For those familiar with the administration of such measures who understand the importance of a consistency of delivery and completion of such forms such a task is not onerous or liable to error. However, understandably there was variation amongst the activity delivery staff in terms of the consistency with which the questionnaires were distributed and collected. This proved challenging to influence and manage, despite direct input in the latter stages of the project from the research assistant who worked part-time on the data inputting and analysis. In hindsight, it is clear it would have been preferable to have had such specialised input built into the study from the start to support and target data collection in the field.

The *International Physical Activity Questionnaire* (IPAQ) was a significant measure in this study and across the other twelve projects funded by Sport England at the same time as this one. The standard presentation of the IPAQ across these projects was important. However, as was raised at initial meetings, the response format used in the IPAQ did present ongoing difficulties. Specifically, the presence of the '*Don't know/Not sure*' response option was problematic because as a response it became over-used and encouraged participants to not think about and estimate their level of activity in the previous week. Hence, the presence of this response option in effect gave rise to much missing data on this important baseline and outcome measure. Exclusion of it as a response possibility would not have significantly altered the psychometric properties of this self-report instrument and would have led to a greater amount of useable data on activity being collected.

Another suggestion that was made in the first year of the project to enhance the rate of data capture was for an automatic alert system via text and/or email to be used one or two days in advance of each follow-up session. This would have reminded instructors and participants to attend appointments. It was also suggested that alternatively a letter could be sent a week prior to the follow-up appointment. However, these improvements were not acted upon until the third year of the project.

V: Main conclusions

All three programmes, EoR, ASfL and Swim&Gym, produced beneficial effects for participants over time for all activity measures (for vigorous & moderate exercise, walking, sport, all activity, and all exercise), for physical health, and for three psychological variables, namely wellbeing, loneliness and motivation. Notably, the gym-swim programme (which combines sport and exercise) produced the biggest positive change in well-being.

Overall, we did not find compelling evidence to support the idea that sport based programmes would provide better outcomes than exercise based ones, though there is limited evidence to suggest that a programme combining the two approaches (i.e. gym-swim) may produce better psychological outcomes.

VI: Recommendations

- Boroughs and councils should provide people with activity referral needs with a choice of either exercise, sport or sport & exercise programmes to maximise opportunities for engagement since each of these forms of activity provide physical and mental health benefits.
- Activities provided should include a mix of those that can take place indoor and outdoor
- Activity provision should not solely focus upon 'exercise' programmes, given the additional social and psychological benefits of group activity
- Activity provision should focus on group activity, since this enhances mental and physical outcomes to a greater degree than ones engaged in individually.
- Activity programmes should build in ongoing evaluation protocols so that the efficacy of intervention components can be monitored regularly in order for provision to be targeted and responsive to changing demographic needs and social context.
- Boroughs and councils should carry out regular population-wide activity needs surveys in order to target service commissioning to maximise their effect.
- Local GPs and other medical professionals should be able to refer to either ASfL or EoR, and not just the latter as is currently the case.
- Additional efforts are needed to engage GPs to refer to the Active Sport for Life Programme, and to encourage them to refer participants with a BMI of 28+ where they judge it to be clinically safe to do so.
- Given the significantly greater uptake of provision by women, particularly of ASfL, it is recommended that additional efforts are made to recruit men onto physical activity programmes
- It is recommended that ongoing provision of physical activities in the boroughs takes account of the fact that swimming is the most popular activity and the one that is reported as most enjoyed.
- It is recommended that boroughs address the low level of intentionality expressed by smokers in the sample to engage with cessation programmes, for example through initiating regional public health campaigns that focus on the health benefits of giving up and on the adverse consequences of not doing so.
- It is recommended that irrespective of physical activity type (whether EoR or ASfL) that on entry to the programme all participants should be offered free twelve month membership, ongoing if attendance continues at a minimum of two sessions per week (120 minutes of activity).

VII: References

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VIII: Appendices

Appendix I: Time 1 Questionnaire booklet

Referral Client Assessment Form

Forename		Surname		ID Number (for Office use only)	
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In the past week, on how many days have you done a total of 30 min or more of physical activity, which was enough to raise your breathing rate? This may include sport, exercise and brisk walking or cycling for recreation or to get to and from places, but should not include housework or physical activity that may be part of your job.

☐

For answers 0 or 1 x 30 continue for Active Sport 4 Life. If 2 x 30 or more refer to other programmes

Physical Activity Questionnaire:

Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling? _____ **days per week**

☐

No vigorous physical activities

➔ **Skip to question 3**

2. How much time did you usually spend doing **vigorous** physical activities on one of those days? _____ **hours per day** _____ **minutes per day**

☐

Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ **days per week**

☐

No moderate physical activities

➔ **Skip to question 5**

4. How much time did you usually spend doing **moderate** physical activities on one of those days? _____ **hours per day** _____ **minutes per day**

☐

Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

☐

No walking

➔ **Skip to question 7**

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐

Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day** _____ **minutes per day**

☐

Don't know/Not sure

Finally, I'd like you to think about any **Sport** that you have done in the **last 7 days**. By **Sport** we mean any competitive or non-competitive sporting activity, including sessions of deliberate exercise such as running or jogging. Think only about those sports or exercises that you did for at least 10 minutes at a time.

8. During the last 7 days, on how many days did you take part in any **sport**?

_____ **days per week** ☐ No sport ➔ **Finish**

9. How much time did you usually spend doing sport on one of those days?

_____ **hours per day** _____ **minutes per day**

☐

Don't know/Not sure

Referred to Programme – please tick

Exercise on Referral:

☐

Active Sport 4 Life

☐

Hearty Lives

☐

Momenta

☐

Weight management

☐

Client Assessment Record - Induction

Patient / Client Details:

Surname:

Title:

Mr / Mrs / Miss / Ms / Other:

First name (s):

ID Number:

(for Office use only)

Date of birth:

Age:

Address:

Address

Town

Post code

Telephone (Home)

Telephone (Mobile)

Email address:

GP Name:

GP Address:

Assessment Details:

Referral received (date):

GP or Self Referral:

Assessment Venue:

Instructor:

Date of Initial assessment:

Date of mid check (6 wk):

Date of end check (12 wk):

Date of end check (6 month):

Date of end check (12 month):

Physical Activity Readiness Questionnaire PARQ (Info for Instructor not monitoring)

How often has your doctor said you have heart trouble? Never / Sometimes / Often / Very Often

Do you frequently suffer from severe dizziness spells? Never / Sometimes / Often / Very Often

Do you frequently suffer from chest pain? Never / Sometimes / Often / Very Often

How often have you ever been told your Blood Pressure is too high?
Very Often Never / Sometimes / Often /

How often have you suffered from Asthma Never / Sometimes / Often / Very Often

How much have you suffered from Asthma Mild / Moderate / Severe

Do you suffer from COPD Yes / No
(Chronic Obstructive Pulmonary Disease)

How often do you suffer from any bone or joint problem i.e. Arthritis or back pain that may be aggravated by exercise?
Repeatedly Never / Sometimes / Often /

Are you Diabetic? Yes / No

What type of diabetes do you have?

Type 1 [] Type 2 []

To what extent are you aware of there being a history of Heart Disease in your family?

lot
None / a little / quite a lot / a

Are there **any other reasons** you know of as to why you should not participate in a sport or physical activity programme? Yes / No

If YES please specify the reason(s)

Disclaimer

I have answered the above questions to the best of my knowledge and accept full responsibility for any injury caused to myself during or after physical activity sessions. It is my responsibility to seek correct medical advice for any current or future medical conditions. I have a duty to inform an exercise referral coordinator of any changes to my health throughout the course of the programme.

If you are in any way concerned about your health please contact a medical professional immediately.

I accept the above statement and responsibilities.

Signed: _____ Date: ____/____/____

I have advised the patient according to the responses they have provided on the above questionnaire.

Instructor signature: _____ Date: ____/____/____

Initial Health Assessment

Reason for Referral: Body Mass Index and low risk only for Active Sport 4 Life

<input type="checkbox"/> BMI	<input type="checkbox"/> 28+	<input type="checkbox"/> 30+	<input type="checkbox"/> 40+	<input type="checkbox"/> Mental Health Issues
<input type="checkbox"/> CHD				<input type="checkbox"/> Bone, joint or mobility problems
<input type="checkbox"/> Hypertension				<input type="checkbox"/> Hypercholesterolemia
<input type="checkbox"/> Diabetes	<input type="checkbox"/> Type 1	<input type="checkbox"/> Type 2	<input type="checkbox"/> Neuromuscular	
<input type="checkbox"/> Respiratory Disorder			<input type="checkbox"/> Other (please specify)	

Health Check Measurements:

Result	Test	Result	Test
<input type="text"/>	Resting blood pressure	<input type="text"/>	Resting heart rate
<input type="text"/>	Height in metres (shoes off)	<input type="text"/>	Weight in KG (shoes off)
<input type="text"/>	BMI (weight in KG) / (Height in M ²)	<input type="text"/>	Number of units of Alcohol currently drunk per week
<input type="text"/>	Do you smoke? – Yes / No	<input type="text"/>	How many years have you been a smoker?

No. of Cigarettes currently smoked
per day

When did
you stop
smoking?

Would you like to be referred to?

Referred to Weight Management Programmes?	Yes	No
Referred to the Stop Smoking Service?	Yes	No

Details of any medication:

Name of medication		Reason for medication

ABOUT YOU - Monitoring Data Form

Q1 Age

☐ Under 20

☐ 20 – 39

☐ 40 – 59

☐ Over 60

Q2 Gender

☐ Male

☐ Female

Q3 How would you describe yourself?

White

☐ British

☐ Irish

☐ Other White (please State) _____

Black or Black British

☐ African

☐ Caribbean

☐ Other Black (Please State) _____

Asian or Asian British

☐ Bangladeshi

☐ Indian

☐ Pakistani

☐ Other Asian (please state) _____

Mixed

☐ White & Black Caribbean

☐ White & Black African

☐ White & Asian

☐ Other Mixed (Please state) _____

Chinese or other ethnic group

☐ Chinese

☐ Other ethnic Group (please state)

Traveller, Romany or English Gypsy

☐ Irish Traveller

☐ Romany

☐ English Gypsy

Q4 What is your faith?

☐ Christian

☐ Muslim

☐ Sikh

☐ Hindu

☐ Jewish

☐ Buddhist

☐ Other (please state) _____

☐ No Religion

Q5 Do you consider yourself to have a disability?

☐ Visual Impairment

☐ Mental Health Issues

☐ Restricted Mobility

☐ Speech Impairment

☐ Hearing Impairment

☐ Learning Difficulty

☐ Wheelchair User

☐ Other Hidden Impairment

☐ No Disability

Q6 What is your main language?

☐ English

☐ Other (please state) _____

Q7 How did you first hear about the Active Sport 4 Life / Exercise on Referral?

☐ Doctor / G.P.

☐ Leaflet

☐ Council Website

☐ Council Social Media

☐ Newspaper

☐ Pharmacist

☐ Social Services

☐ Weight Watchers

☐ Stop Smoking Service

☐ Other Health Professional

☐ Other

Personal Health and Motivational Questionnaires

Q1 Overall, how would you rate your health during the past 4 weeks?

☐ Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐ Very Poor

Q2 During the past 4 weeks, how much did physical health problems limit your usual everyday physical activities (such as walking or climbing the stairs)?

☐ Not at all ☐ Very little ☐ Some ☐ Quite a lot ☐ Couldn't do physical activity

Q3 During the past 4 weeks, how much difficulty did you have doing your daily work, both at home and away from home because of your physical health?

☐ None at all ☐ A little bit ☐ Some ☐ Quite a lot ☐ Couldn't do any work

Q4 How much bodily pain have you had during the past 4 weeks?

☐ None ☐ Very mild ☐ Mild ☐ Moderate ☐ Severe ☐ Very severe

Q5 During the past 4 weeks, how much energy did you feel that you had?

☐ Lots ☐ Quite a lot ☐ Some ☐ A little ☐ None

Q6 During the past 4 weeks, how much did your physical health limit your usual social activities with family or friends?

☐ Not at all ☐ Very little ☐ Some ☐ Quite a lot ☐ Couldn't do social activities

Q7 During the past 4 weeks, how much have you been bothered by emotional problems (such as feeling anxious, depressed or irritable)?

☐ Not at all ☐ Slightly ☐ Moderately ☐ Quite a lot ☐ Extremely

Q8 During the past 4 weeks, how much did emotional problems keep you from doing your usual work or daily activities?

☐ Not at all ☐ Very little ☐ Some ☐ Quite a lot ☐ Couldn't do daily activities

Q9 During the past 4 weeks, how much did your emotional problems limit your usual social activities with family or friends?

☐ Not at all ☐ Very little ☐ Some ☐ Quite a lot ☐ Couldn't do social activities

Please indicate for each of the following statements which is the closest you have been feeling during the past 4 weeks

Q10 I have felt cheerful and in good spirits

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q11 I have felt calm and relaxed

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q12 I have felt active and vigorous

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q13 I woke up feeling fresh and rested

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q14 My daily life has been filled with things that interest me

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q15 I feel I lack companionship

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

—

Q16 I feel left out

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q17 I feel isolated from others

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

How much do you agree with the following statements? (Please tick all that apply)

Taking part in the Active Sport 4 Life / EOR Programme will.....	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
...help me to feel in good physical shape.					
...help me to improve my health					
... help me to improve my overall wellbeing.					
...help me to feel a sense of achievement.					
...help me to perform daily functional jobs and tasks.					
...mean I can get out of the house and meet new people.					
...help me lose or control my weight					

What other ways do you think that the programme will benefit you?

Do you find it easy to keep your goals?

☐ Yes ☐ Sometimes ☐ Rarely ☐ Never ☐ I never set goals anyway

Have you ever exercised regularly?

☐

Yes

☐

No

If yes, when and how often do you exercise?

Why did you give up?

What type of activity do you like to do?

Agreement:

I confirm that these goals have been set and agreed by me and I know that only I can achieve them, with help and support from the health and fitness team, friends and family.

Patient Signature:		Date:	
Fitness Instructor:		Date:	

Appendix II: Six Weeks, twelve weeks, six months, nine months and twelve months follow-up physical & mental health questionnaire

Health Assessment

Forename		Surname		ID Number (for Office use only)	
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Physical Activity Questionnaire:

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling? _____ **days per week**

☐

No vigorous physical activities

➔ **Skip to question 3**

2. How much time did you usually spend doing **vigorous** physical activities on one of those days? _____ **hours per day** _____ **minutes per day**

☐

Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ **days per week**

☐

No moderate physical activities

➔ **Skip to question 5**

4. How much time did you usually spend doing **moderate** physical activities on one of those days? _____ **hours per day** _____ **minutes per day**

☐

Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you might do solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

☐

No walking



Skip to question 7

6. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐

Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

☐

Don't know/Not sure

Finally, I'd like you to think about any **Sport** that you have done in the **last 7 days**. By **Sport** we mean any competitive or non-competitive sporting activity, including sessions of deliberate exercise such as running or jogging. Think only about those sports or exercises that you did for at least 10 minutes at a time.

8. During the last 7 days, on how many days did you take part in any **sport**?

_____ **days per week**

☐

No sport



Finish

9. How much time did you usually spend doing sport on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐

Don't know/Not sure

Mid Check Measurements:

Result	Test	Result	Test
<input type="text"/>	Resting blood pressure	<input type="text"/>	Activity Level – How many minutes per week?
<input type="text"/>	Resting heart rate	<input type="text"/>	Do you smoke? – Yes / No
<input type="text"/>	Height in meters (shoes off)	<input type="text"/>	Number of Cigarettes currently smoked per day
<input type="text"/>	Weight in KG (shoes off)	<input type="text"/>	Number of units of Alcohol currently drunk per week
<input type="text"/>	BMI (weight in KG) / (Height in M ²)	When did you stop smoking?	

Did you attend Weight Management Programme?	Yes		No	
How many times did you attend?	1-2	3-4	5+	
Did you attend the Stop Smoking Service?	Yes		No	
Have you cut down on smoking?	Yes		No	
If 'YES' how many cigarettes a day have you managed to cut down?				
Do you consume less alcohol since starting the programme?	Yes		No	
If 'Yes' how many units have you cut down by?				

Details of any medication:

Name of medication		Reason for medication

Details of Sports Activity:

Name of Club		Sessions per week

Personal Health and Motivational Questionnaires

Q1 Overall, how would you rate your health during the past 4 weeks?

☐ Excellent ☐ Very Good ☐ Good ☐ Fair ☐ Poor ☐ Very Poor

Q2 During the past 4 weeks, how much did physical health problems limit your usual everyday physical activities (such as walking or climbing the stairs)?

☐ Not at all ☐ Very little ☐ Some ☐ Quite a lot ☐ Couldn't do physical activity

Q3 During the past 4 weeks, how much difficulty did you have doing your daily work, both at home and away from home because of your physical health?

☐ None at all ☐ A little bit ☐ Some ☐ Quite a lot ☐ Couldn't do any work

Q4 How much bodily pain have you had during the past 4 weeks?

☐ None ☐ Very mild ☐ Mild ☐ Moderate ☐ Severe ☐ Very severe

Q5 During the past 4 weeks, how much energy did you feel that you had?

☐ Lots ☐ Quite a lot ☐ Some ☐ A little ☐ None

Q6 During the past 4 weeks, how much did your physical health limit your usual social activities with family or friends?

☐ Not at all ☐ Very little ☐ Some ☐ Quite a lot ☐ Couldn't do social activities

Q7 During the past 4 weeks, how much have you been bothered by emotional problems (such as feeling anxious, depressed or irritable)?

☐ Not at all ☐ Slightly ☐ Moderately ☐ Quite a lot ☐ Extremely

—

Q8 During the past 4 weeks, how much did emotional problems keep you from doing your usual work or daily activities?

☐ Not at all ☐ Very little ☐ Some ☐ Quite a lot ☐ Couldn't do daily activities

Q9 During the past 4 weeks, how much did your emotional problems limit your usual social activities with family or friends?

☐ Not at all ☐ Very little ☐ Some ☐ Quite a lot ☐ Couldn't do social activities

Please indicate for each of the following statements which is the closest you have been feeling during the past 4 weeks

Q10 I have felt cheerful and in good spirits

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q11 I have felt calm and relaxed

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q12 I have felt active and vigorous

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q13 I woke up feeling fresh and rested

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q14 My daily life has been filled with things that interest me

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q15 I feel I lack companionship

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q16 I feel left out

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

Q17 I feel isolated from others

☐ All of the time ☐ Most of the time ☐ Some of the time ☐ At no time

How much do you agree with the following statements? (Please tick all that apply)

Taking part in the Active Sport 4 Life / EOR Programme will.....	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
...help me to feel in good physical shape.					
...help me to improve my health					
... help me to improve my overall wellbeing.					
...help me to feel a sense of achievement.					
...help me to perform daily functional jobs and tasks.					
...mean I can get out of the house and meet new people.					
...help me lose or control my weight					

Are there any other ways this programme is benefiting you?

Are there any other sports activities you would like to see on the Active Sport 4 Life programme?

Appendix III: Case Studies

Case study 1 (author: Dean Baldwin)

Name: Sandra (name changed for anonymity)	
Age: 41 Years	
Initial measurements: 28.04.2016	Final measurements: 22.07.2016
Initial weight: 95.8kg	Final weight: 89.2kg
BMI: 32.1	BMI: 29.9
Resting Pulse: 80bpm	Resting Pulse: 69bpm (<i>11bpm reduction</i>)
Blood Pressure: 141/85mmHg	Final Blood Pressure: 136/75mmHg
Activities attended	AS4L Swim-fit, Belhus L/C & Karate with M. Adams

Her story: After my usual the Christmas indulgence and continuous yearly weight gain. I realised something needed to change. I knew dieting wasn't a long term solution; it had to be a lifestyle change.

At the end of April I discovered Active Sport 4 Life which seemed to offer me the start and support I needed. At my first appointment with Dean I was weighed and we discussed the many fitness classes on offer. Keen for a challenge I signed up for swimming and karate. Swimming I had avoided for years and karate was a whole new experience for me. Both classes were a real challenge physically and mentally, but the people were really welcoming and friendly so I stuck with it.

At my six week review with Dean I had lost 10lbs. Pleased with my achievement I continued with Karate and swimming, each twice a week. My husband and children now also joining karate. Fitness was becoming a lifestyle for me. I continued to lose weight through regular exercise. By my twelve week review I had lost another 4.5lbs. My other achievement was in July, I graded for my yellow belt in karate. Unfortunately I let the six week school holidays disrupt my exercise routine. By the time I had my third review with Dean I had lost my fitness and also not lost any extra weight. Anxiety was creeping back into my daily life. I felt disappointed and had let myself down; my lifestyle had slipped back as before. But I had learnt a valuable lesson, being regular exercise is vital for my physical and mental wellbeing. I am now back on track, regularly swimming and training for my orange belt in karate. This scheme has enabled me to experience new activities which I may never have considered before. It has also allowed me to meet new people, challenge myself and become a fitter healthier happier person, who has more energy for life.

Case study 2 (author: Dean Baldwin)

Name: Mary (name changed for anonymity)	
Age: 41 Years	
<i>Initial measurements: 19.01.2016</i>	<i>Final measurements: 09.08.2016</i>
Initial weight: 99.4kg	Final weight: 94.7
BMI: 33.87	BMI: 32.3
Resting pulse: 72bpm	Resting pulse: 63bpm (<i>9bpm reduction</i>)
Blood pressure: 117/78mmHg	Blood pressure: 109/59mmHg
Activities attended	Gym & Swim, Blackshots Leisure Centre

Her story: I initially joined Vitality Healthy for Life Programme with the aim of losing weight, bringing down my BMI and most especially to have a holistic healthy lifestyle. I weighed 104kg at the inception of the programme.

During the first week of the programme, we were taught how to eat in portion sizes. I took this session of the programme very seriously as i have always eaten in large quantities in the past and always skipped breakfast in the past.

Now, I am happy to say that breakfast is the most important meal and I observe it judiciously. I eat Weetabix or porridge and in between when I get hungry I eat fruits contrary to me stuffing up myself with different types of food, eating when I am thirsty and vice versa. The Vitality Health programme changed this habit and has helped me to cultivate a healthy habit of starting my day with a healthy breakfast. It has also narrowed down the portion sizes I eat. I am happy to say that I do not skip breakfast anymore though it was a bit of a struggle at first. No more intermittent meals instead I replace those with fruits and water whenever I find myself craving to eat at intervals.

I now have a routine of eating my lunch at 3pm and as a matter of fact after a week of engaging in this programme, I am very happy to say it has yielded massive results, I was weighed and I had lost 2.5kg. My joy knew no bounds. I became more motivated and encouraged to continue because I could see the results. The next thing I did was to set a target for myself with a view to reducing on the number of kg I weigh and to my greatest surprise, this worked for me and has continued to work immensely for me. In the past, I used to feel quite heavy, and can barely walk a short distance or climb stairs without panting and out of breath but after I have been privileged to participate in this programme, I now feel very light, I am able to climb stairs and walk short distances without panting or running out of breath.

In addition to the aforementioned, I have also joined the gym via Active Sport 4 Life where I exercise for two hours every five days in the week. I go on the treadmill, cycling and i do most of the cardiovascular exercise. I eat healthy and I walk about 10,000 steps five days every week after school run. This programme has made me to know that an active life is a healthy life. It has improved my self-confidence tremendously and I have gained more importantly a healthy lifestyle. I am now fully aware of food labels, understanding carbohydrates and blood sugar cycle, fats and risks factors, food and how it can affect my mood, the psychology of eating and stress awareness, knowing that diets don't work, healthy snacking and most of all maintaining my weight loss by regular exercising in the gym and maintaining a healthy life-style.

Case Study 3 (provided by Nicola Richardson)

Andrew (name changed for anonymity)

Dagenham

Essex

30th January 2017

Abbey Leisure Centre
Bobby Moore Way
Barking
IG11 7HW

Dear Nicola,

I would like to inform you to let you know how the active fit for life program helped me. As you are aware I have a ongoing health problem with my hip resulting a knock on affect to many other health problems which one is depression, due to the hip I was advised that the only form of exercise that I could Possibly do was swimming and during my time on ASFL I felt that it helped me with my condition resulting that whilst in the pool I was pain free and also helping me get the needed exercise that I have been lacking due to the condition.

When in the pool it also helped with the depression giving my mood a boost knowing that there was something I was able to do to help myself and forget about all the problems that I occur on a day to day basis.

I hope this letter gives you valuable insight about how the program has helped me and if I'm honest it's a shame that the program has stopped or has a limited time span yes I could of paid from a membership but I am unable to use the gym and it would not be cost affected due to this I feel like I'm back to square one due to it ending shame really we do need more of this around LBBD.

Yours sincerely,

Andrew (name changed to ensure anonymity)